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NORTHERN CALIFORNIA'S COMPUTER MAGAZINE MAY 20, 1994 • #123 FREE

10

MICROTIMES

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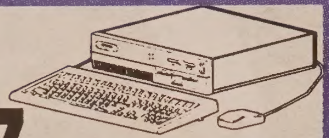
COMPAQ 486SX-33MHz



PRESARIO 633 200MB SYSTEM

486SX-33MHz CPU • 200MB Hard Drive • 4MB RAM expandable to 32MB • Dual Floppy Drive • Local BUS SVGA • 3 ISA expansion slots • 3 drive bays • Internal fax/modem • Preinstalled software: MS DOS • MS Windows 3.1 COMPAC Mouse • PFS: WindowWorks 2.0 • Delrina WinFax Lite • Prodigy • America On-Line Symantec Games Pack
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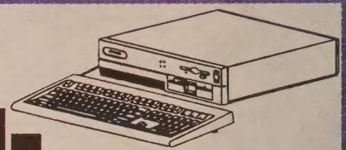
COMPAQ 486DX-33MHz



PROLINEA 4/33 240 240MB SVGA SYSTEM

80486DX 33MHz CPU • 240MB Hard Drive • 4MB RAM Expandable to 32MB • SVGA Card • 3.5" 1.44MB/5.25" 1.2MB Floppy Drives • DOS 5.0 • MS Windows 3.1 • Pointing Device • Keyboard Clock/Calendar • Case/Power Supply • 3 Year Warranty • **Monitor Sold Separately**

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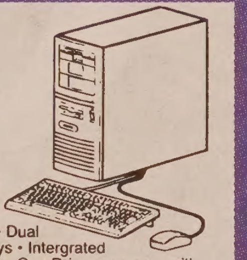

PRESARIO 850 270MB MINI SYSTEM

486DX2-50MHz CPU • 270MB Hard Drive • 4MB RAM expandable to 56MB • Dual Floppy Drive • Local BUS video graphics • 5 ISA expansion slots • 5 drive bays • Intergrated fax/modem • Supports Intel OverDrive processor(486DX2/66), as well as future OverDrive processor with Pentium technology **Preinstalled software:** MS DOS • TabWorks • MS Windows 3.1 • MS Works • Delrina WinFax Lite • Prodigy • America On-Line • Microsoft Entertainment Pack Symantec Games Pack
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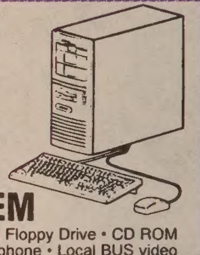

PRESARIO 833 CDS 270MB MINI SYSTEM

486SX-33MHz CPU • 270MB Hard Drive • 4MB RAM expandable to 56MB • Dual Floppy Drive • CD ROM drive (Dual-Speed) • SoundBlaster 16 Audio Board • External speakers and microphone • Local BUS video graphics 4 ISA expansion slots • 5 drive bays • Intergrated fax/modem Supports Intel OverDrive processor(486DX2/66), as well as future OverDrive processor with Pentium technology • Preinstalled software: MS DOS • TabWorks • MS Windows 3.1 • COMPAC Mouse • Microsoft Works • Delrina WinFax Lite Prodigy • America On-Line • Microsoft Entertainment Pack Symantec Games Pack • CD ROM Titles • Quicken for Windows 2.0 • **Monitor Sold Seperately**

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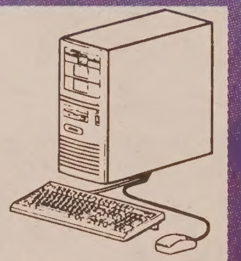

PRESARIO 866
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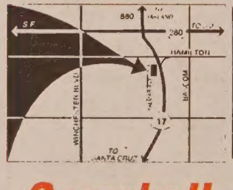
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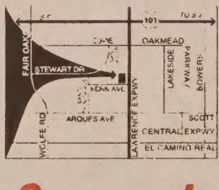
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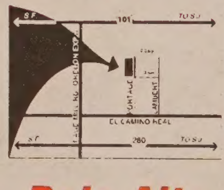
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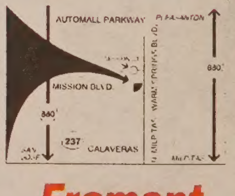
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Who Needs Optical? You do. Here's why.

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2.You get portability.

You can slip 1,000 Megabytes in your shirt pocket or 10,000 megabytes in your briefcase. Optical cartridges are small, light, and rugged. Standard double sided 650MB and 1GB optical disks are used by thousands of major corporations and graphic service bureaus across the country. *They can read your disks now!* Millions of megabytes of databases, programs, and graphic files are shipped safely every day on optical media. Would you rather ship 25 SyQuest™ cartridges or one optical disk?

3.You get performance and reliability.

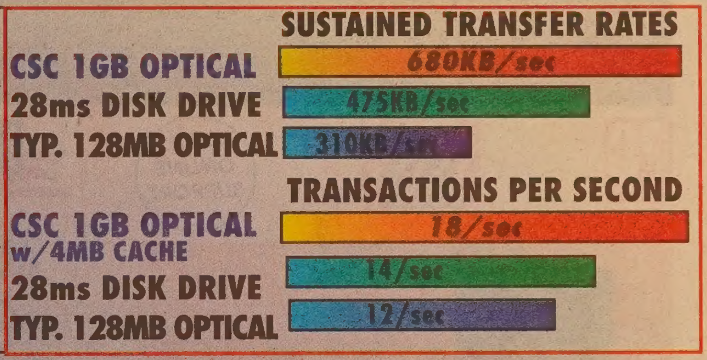
Optical technology is approaching the performance of hard disks. You can actually run programs from your optical drive with great performance. Experts in graphics design, digital audio and video insist on CSC optical drives.

4.You get the ultimate backup and retrieval system.

When your hard disk fills up, just offload files to the optical drive. You can retrieve files instantly and you can *run programs from your optical drive.* Your only other reliable backup alternative is DAT tape. DAT works well, but it can take hours to backup and restore your files. And you'll never be able to run programs from a DAT tape.

If you're transporting large files, backing up critical data, working with an advanced operating system, or just plain out of hard disk space, *there's no substitute for a fast optical drive.*

What about performance? CSC optical drives are chosen by disk technicians for top performance and reliability. We avoid small, low performance units. An optical disk drive's performance is rated in terms of transfer rate and seek times. Here's how they compare:



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2. SCSI provides performance and high data transfer rates. SCSI's ability to connect seven drives and operate them concurrently is essential for high performance. Modern multitasking operating systems, like OS/2, Windows NT, Mac System 7 and UNIX offer full support for SCSI. *If you don't have a SCSI port yet, call us today.* We manufacture a complete line of high performance SCSI controllers.

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Look through this magazine and compare price per megabyte. You'll find others trying to sell smaller, slower 128MB drives for almost the same price as CSC's new high performance double sided 650MB units! Shop around. *Compare price and service.* When you're ready for optical, CSC is ready to help. Our technicians are optical experts-they'll help you install it yourself!

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This month's BBS column: Online street smarts

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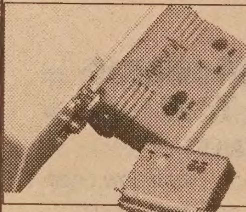

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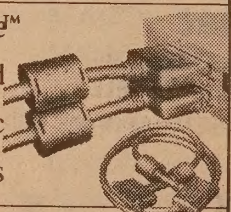

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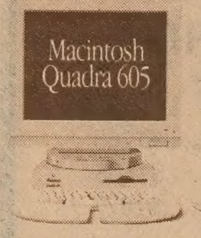

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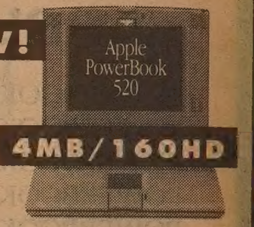

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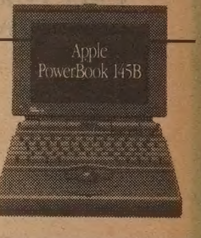

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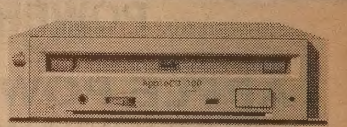

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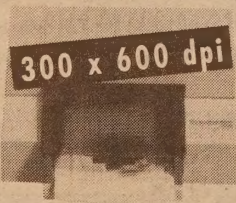

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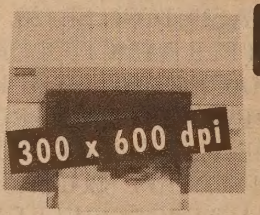

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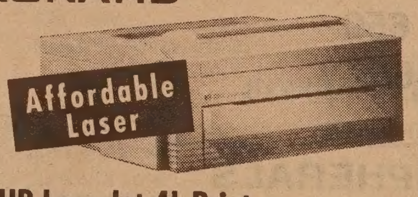

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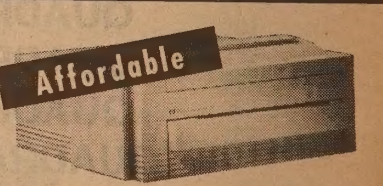

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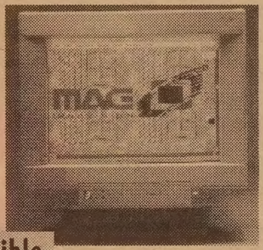

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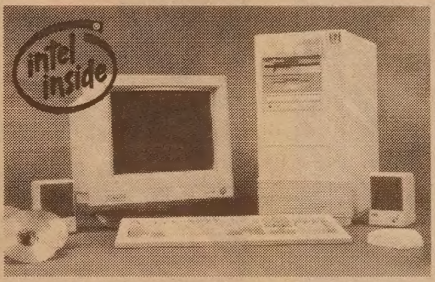

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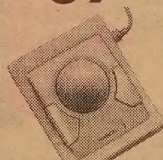

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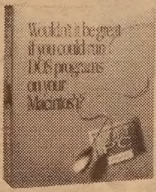

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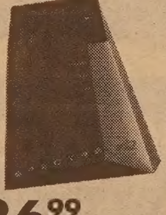

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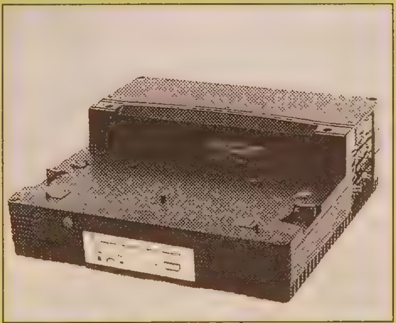

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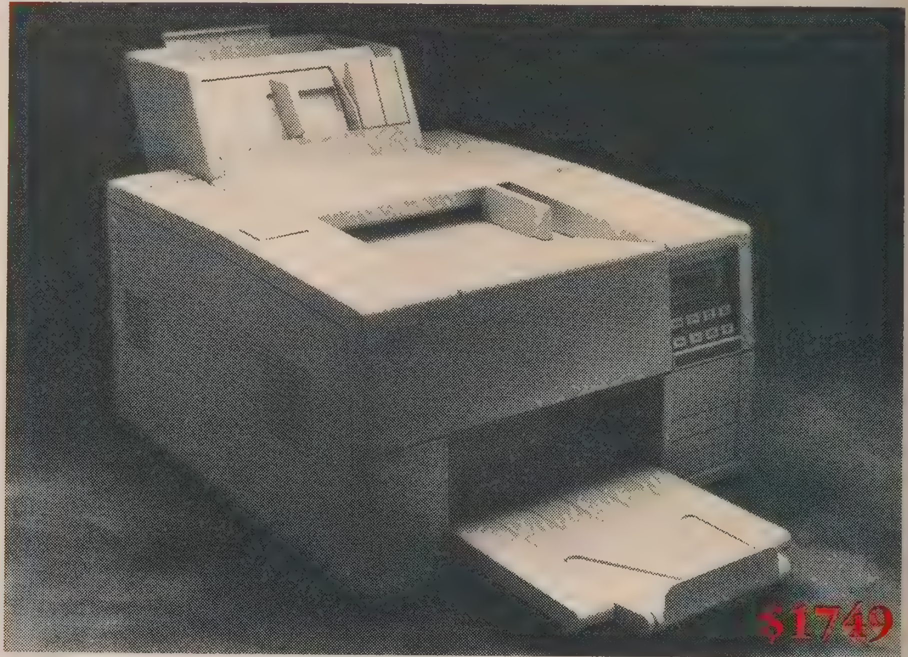

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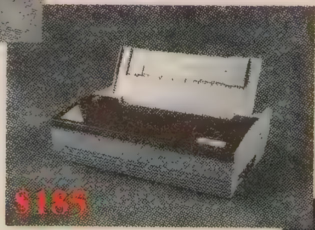

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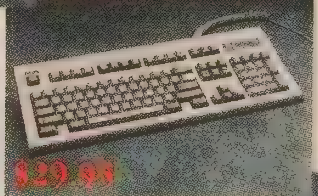

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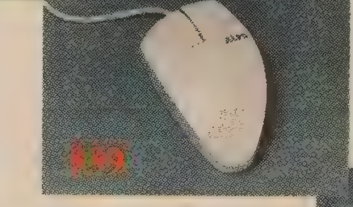

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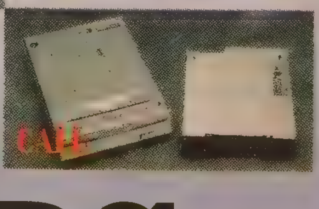

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A Note From The Editors

Ten years after our improbable beginning as a spinoff of a rock 'n' roll publication, we invite you to join with us in celebrating this momentous anniversary.

Art Coordinator Monika Lukenbill and **Senior Designer Rick Colby** have been working even harder than usual to create a new "look and feel" for the magazine, and we hope you'll like it. Once again, our intrepid contributors have gone out into their various worlds and brought back what we hope you'll find unique and useful information, and their grateful editors would like to salute them for their years of diligent efforts.

We expect the computer industry and the people that create it to go right on changing at the same bewildering rate of the last decade or so, and we hope you'll stay with us as we continue to cover them. Thanks for your support over the last ten years.

—ME

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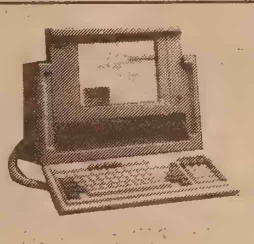

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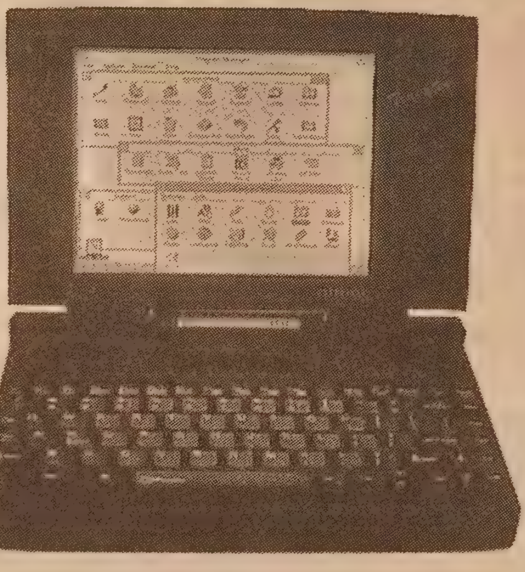

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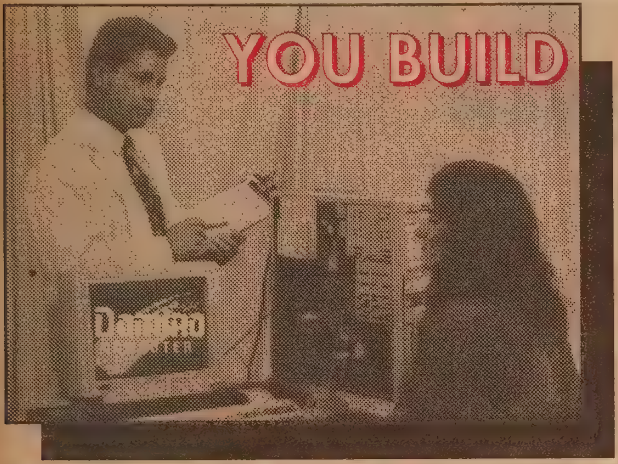

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Industry Insight

Chip Wars: Two-Prong Attack Against Intel

On The Right, IBM and Cyrix...

After AMD grabbed the Intel-clone limelight last month by winning a significant legal case, tiny Texas-based Cyrix may have scored an even bigger win by striking a deal with IBM to have the giant company manufacture its CPUs. By taking advantage of IBM's huge manufacturing capacity, Cyrix can assure PC makers enough chips when they want them. Further, IBM's chip-making processes are considered significantly more advanced than those of many other companies, giving Cyrix an additional boost.

IBM also does very well in the deal. Because of its current licenses for Intel's 486 technology, IBM is not hurting for the current generation of CPUs. For the next generation, IBM can use Cyrix's long-rumored M1 Intel-clone. Or, more likely, IBM will continue its current push for the PowerPC RISC CPU, probably adding a native 486 core to the chip to get it to run PC programs without modification.

The agreement will mostly help users of low-end systems and portables this year, since that's Cyrix's strongest market. With IBM's better manufacturing facilities, Cyrix can drive down its cost per chip through higher yields. Intel will likely have to drop its 486 prices in response, possibly lower than planned after its loss to AMD in court last month. The deal also lets IBM sell the CPUs into the same markets with IBM labels, but this is not expected to be a significant help to the behemoth.

The deal, which may be changed due to legal pressures in the coming months, will really change things about six months from now when the M1 begins shipping in quantity, probably from both Cyrix and IBM. If IBM puts the M1 in many of its more popular high-end machines, it will gain an incredible amount of good publicity, possibly edging AMD out of the high-end race. Even if the chip doesn't do that well, IBM will still be producing the PowerPC chip, which could be considered a competitor. Unless Intel drops the price of the current family of Pentium chips or gets the next generation out sooner than expected, there could be much more competition than anyone expected a year ago.

> Unless Intel drops the price of the current family of Pentium chips or gets the next generation out sooner than expected, there could be much more competition than anyone expected a year ago.

IBM's manufacturing prowess will probably get much more publicity in about a year when it modifies the M1 to take advantage of some of its technology. Chip-making processes are somewhat arcane, and IBM is well known for having methods for making chips smaller and more adaptable to many types of motherboards. IBM could take the M1 and tweak it in ways that fit its processing technology well and produce faster, lower-power, and cheaper chips. Intel, no slouch when it comes to manufacturing, may have to speed up its building of new chip plants to keep up with the new CPUs.

...On The Left, IBM and Motorola

Keeping the heat on Intel's Pentium PC, IBM and Motorola have announced their new PowerPC 604 CPU that will ship by the end of this year. The 604 is faster than the current Pentium chips, and is likely to be faster than the Pentiums that will probably become available early next year. Do not be confused by its lackluster name: the difference between the current PowerPC 603 and soon-to-be-released 601 and the future 604 is as large as the difference between Intel's 486 and Pentium CPUs. Just to rub Intel's nose in the dirt a bit more, the companies also announced that they will ship a faster version of the 601 by the end of the year.

The 604 will run all the programs designed for the 601, but will run them much faster. Companies who recompile their code for the 604 will gain an even more significant speed increase. Based on the integer-math speed ratings used by most companies, the SPECint92, the PowerPC 604 will run faster than any expected Pentium, and may only be surpassed by Intel's next generation, the P6, which is not due until late next year. The floating-point math speed is also significantly better. Surprisingly, the cost of the 604 is not expected to be significantly more than the high-end Pentiums, even at twice the speed.

IBM and Motorola's announcement will put a great deal of pressure on Intel in the short run. Work on Windows NT for the PowerPC is moving along quickly and will certainly be done by the time IBM and other vendors start shipping 604-based systems at the end of this year. Although Apple is not expected to ship high-end 604-based systems until early 1995, when it does, they will blow away most shipping Pentium systems used as network servers and as personal workstations. Even if Intel delivers its expected 100 MHz Pentium chips in desktop systems, the PowerPC 604 systems will run 60% faster for integer operations and 100% faster for floating-point operations.

Internally, the 604 uses many new features that have not been exploited in earlier PowerPC CPUs. These features include better anticipation of decisions, better response for when it predicts correctly, and better internal caching of instructions. Some of these features appear in the Pentium, and will certainly appear in the P6, but IBM and Motorola have been able to include the right combination of prediction and cache usage to get the speed of the chip well above the Pentium, and pos-

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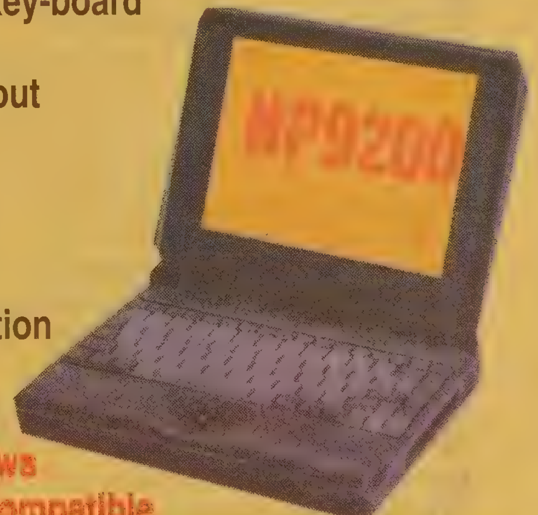

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As more disabled people enter the mainstream, due in part to the recent implementation of the Americans with Disabilities Act, computer dealers will probably have a greater sensitivity to the disabled market.

sibly even above the P6. Although the expected manufacturing cost of the 604 is more than twice that of the 601, it is probably the same or a bit less than Intel's will be for the P6.

No one expects the 604 to cause mass abandonment of the Intel family. However, when it arrives six months from now, it will certainly put a dent in the Pentium market, particularly for graphics, server, and multimedia workstations. It will help strengthen Apple's current PowerPC line, which is selling quite well, and will give Motorola a strong image boost. Most importantly, it will help IBM hedge its bets on the future since IBM will probably be starting to manufacture Cyrix's high-end M1 CPU at the same time. Unless Intel drops prices or speeds its development, both difficult tasks, it should look for less growth in the coming years.

Two Types Of Compression For DOS 6 Users

As an outgrowth of Stac's successful lawsuit against Microsoft, PC users will have two different compression programs built into their DOS version 6 programs in the near future.

Before the suit, Microsoft was using DoubleSpace, based on Stac's algorithm, in its MS-DOS operating system, while IBM had licensed SuperStor for its PC-DOS. Now, Microsoft will start to use a new, as-yet-unnamed algorithm in its upcoming DOS 6.3, while IBM will start to use Stac's algorithm in their future versions.

Although there has not been a huge outcry against the compression-less MS-DOS 6.21, many people have been pirating MS-DOS 6.2 so that they can use DoubleSpace. Microsoft, having played up DoubleSpace as a major feature, needs to find a good replacement for it. MS-DOS version 6.3 is starting its beta test and will probably be ready in June or July. Microsoft is expected to give the upgrade free or for very low cost to users who bought version 6.21; it is not clear how manufacturers who include MS-DOS on their systems will handle upgrades.

IBM, on the other hand, has agreed to use Stac software in releases after PC-DOS 6.3, which has just been released. Version 6.3 has some small improvements in memory use and speed, and it is unfortunate that IBM could not work the new drivers into it. Instead, IBM will probably test the technology for a while and release it in future versions of PC-DOS and of OS/2.

Apple Takes High Road In Disability Sales

Recognizing a huge market for its computers and software, Apple has announced its "Aisle 17" service, a mail-order store specializing in the needs of disabled people. Aisle 17 will sell computers, peripherals, and software specifically targeted at disabilities. Apple expects the primary audience to be disabled people, although they will support people who work with the disabled as well.

One of the biggest problems for disabled people using adaptive hardware devices or software with their computers has been support. Users could not get straight answers when there was a failure between the systems. Because adaptive devices often take over a major part of the computer, computer makers would not take responsibility for problems that were caused by the devices. With Aisle 17, Apple will support both the computers and the add-ons from a single location.

Apple chose the name "Aisle 17" to indicate that the service shouldn't be anything special: just another aisle in the store. As more disabled people enter the mainstream, due in part to the recent implementation of the Americans with Disabilities Act, computer dealers will probably have a greater sensitivity to the disabled market. By being the most visible such dealer, Apple hopes to establish itself (and, of course, its computers), as leaders in the growing market. The service can be reached at (800) 600-7808 for voice, or (800) 755-0601 for those using TDD devices. ■

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continued on page 98

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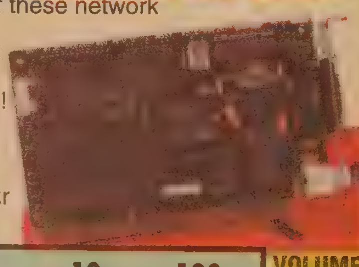

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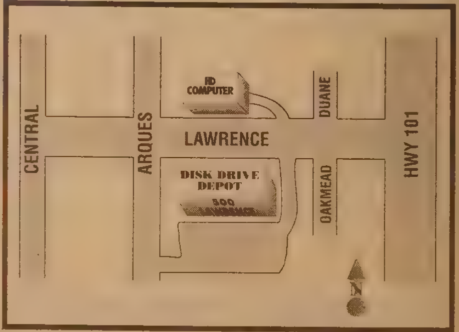

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COMPUTER STOCKS FALL UNDER WEIGHT OF SELL ORDERS

Continuing the trend that started in March, computing stocks fell victim to sell orders from a jittery investing public during the month of April. This profit-taking took its toll on the thirty-two stocks in the MicroTimes Stock Index, as it backtracked a hefty 4.89% before coming to rest at 4639.86—a six-month low. Our index paled next to such indicators as the S&P 500, which gained .58% to close at 450.91.

Turning to stocks in the accompanying table:

Digital Equipment's stock sank like a stone last month, falling $8.25 a share, or 27.7%, en route to a close of $21.50. Shareholders of the company filed two lawsuits in federal court alleging that they were misled by the company. The suits came on the heels of DEC's disappointing third-quarter earnings report: the company posted a loss of $183.3 million and said it will cut another 7,000 jobs, or about 8% of its total workforce, over the next three months. Digital was the largest casualty on a percentage-lost basis last month.

Lotus was the largest dollar-loser last month, as it fell $8.63 a share to $63.38. Shares of the Cambridge, MA-based software concern toppled after it recorded slower-than-expected first-quarter sales growth. Informix surrendered $4.25 a share, or 20.2%, to close at $21 a share. The company's first-quarter earnings rose to 19 cents a share from 17 cents in the year-ago period. Analysts, however, were expecting it to post earnings of 20 cents a share.

Dell's share price contracted 18% before ending at $22.75. The stock toppled after Dell said it faces "material" trading losses in the derivatives market in the latest quarter. In Canada, Northern Telecom sprang forward 7.2% to conclude matters at $29.88 a share. The Toronto-based concern recently posted a first-quarter earnings report card in which net income rose 16% to $88 million, sales gained 3% to $2 billion, and NT showed an unexpected operating profit of $52 million vs. an expected loss. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 04/05/94	CLOSING PRICE 04/29/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	26.25	25.50	–0.75	–2.86	21	0.20	0.78	37.00	16.25
OTC	Aldus		ALDC	29.00	28.38	–0.63	–2.16	40	0.00	0.00	34.50	13.50
OTC	Autodesk		ACAD	58.13	54.00	–4.13	–7.10	22	0.48	0.89	61.75	37.00
OTC	Borland	(L)	BORL	13.69	12.00	–1.69	–12.33	22	0.00	0.00	27.25	11.38
OTC	Informix		IFMX	21.00	16.75	–4.25	–20.24	20	0.00	0.00	27.25	15.75
OTC	Lotus		LOTS	72.00	63.38	–8.63	–11.98	46	0.00	0.00	86.50	25.50
OTC	Microsoft		MSFT	87.75	92.13	4.38	4.99	26	0.00	0.00	98.00	70.38
OTC	Novell	(L)	NOVL	18.38	18.63	0.25	1.36	–	0.00	0.00	33.50	15.38
OTC	Oracle		ORCL	33.31	29.88	–3.44	–10.32	36	0.00	0.00	37.75	17.69
OTC	Software Publishing	(L)	SPCO	7.13	5.25	–1.88	–26.32	–	0.00	0.00	8.63	4.75
OTC	Symantec		SYMC	16.88	15.88	–1.00	–5.93	–	0.00	0.00	20.50	10.88
	HARDWARE											
OTC	Apple		AAPL	33.50	30.25	–3.25	–9.70	–	0.48	1.59	59.13	22.00
OTC	AST Research		ASTA	21.63	18.75	–2.88	–13.29	–	0.00	0.00	33.00	13.50
NYS	Commodore	(L)	CBU	0.75	0.88	0.13	16.67	–	0.00	0.00	4.63	0.50
NYS	Compaq		CPQ	100.88	109.25	8.38	8.30	17	0.00	0.00	112.25	43.13
NYS	Digital Equipment	(L)	DEC	29.75	21.50	–8.25	–27.73	–	0.00	0.00	48.25	18.25
OTC	Dell		DELL	27.75	22.75	–5.00	–18.02	–	0.00	0.00	34.38	13.50
NYS	Hewlett–Packard		HWP	82.25	78.75	–3.50	–4.26	16	1.00	1.27	93.63	64.38
NYS	IBM		IBM	53.38	57.13	3.75	7.03	–	1.00	1.75	60.00	40.63
NYS	Silicon Graphics		SGI	23.63	24.25	0.63	2.65	28	0.00	0.00	26.88	16.00
OTC	Sun Microsystems	(L)	SUNW	22.25	22.38	0.13	0.56	12	0.00	0.00	32.63	20.88
NYS	Xerox	(H)	XRX	97.50	98.88	1.38	1.41	–	3.00	3.03	104.88	69.88
NYS	Tandy		TAN	36.50	33.13	–3.38	–9.25	14	0.60	1.81	50.75	28.13
	CPU'S											
NYS	Advanced Micro Devices		AMD	30.25	26.00	–4.25	–14.05	10	0.00	0.00	32.75	16.75
OTC	Intel		INTC	68.75	61.69	–7.06	–10.27	11	0.20	0.32	74.50	47.50
NYS	LSI Logic	(H)	LSI	20.50	22.25	1.75	8.54	18	0.00	0.00	23.13	11.25
NYS	Motorola		MOT	52.31	44.63	–7.69	–14.70	23	0.28	0.63	54.88	36.19
	COMMUNICATIONS											
NYS	AT&T	(L)	T	52.00	51.25	–0.75	–1.44	17	1.32	2.58	65.00	49.50
NYS	BellSouth Corp.		BLS	57.00	60.63	3.63	6.36	25	2.76	4.55	63.88	50.63
OTC	MCI	(L)	MCIC	23.13	22.88	–0.25	–1.08	20	0.04	0.17	29.88	21.38
NYS	Northern Telecom		NT	27.88	29.88	2.00	7.17	–	0.36	1.21	38.63	21.38
NYS	Pacific Telesis		PAC	31.38	31.88	0.50	1.59	–	2.16	6.78	34.50	26.19

Note: Motorola completed a 2–for–1 stock split on 4/18/94.

KEY: NYS = NEW YORK ASE = AMERICAN OTC = OVER THE COUNTER

(H) = NEW HIGH REACHED IN PERIOD (L) = NEW LOW REACHED IN PERIOD

MARKET DIARY:

ADVANCES	12
DECLINES	20
UNCHANGED	0
NEW HIGHS	2
NEW LOWS	8

MOST ACTIVE ISSUES:

LARGEST DOLLAR GAINER	Compaq	$	8.38
LARGEST DOLLAR LOSER	Lotus	$	–8.63
LARGEST PERCENTAGE GAINER	Commodore		16.67 %
LARGEST PERCENTAGE LOSER	Digital Equipment		–27.73 %

	CLOSE 04/05/94	CLOSE 04/29/94	NET CHANGE IN PERIOD	PERCENT CHANGE IN PERIOD
MICROTIMES STOCK INDEX	4878.26	4639.86	–238.40	–4.89
DOW JONES INDUSTRIAL AVERAGE	3675.41	3668.31	–7.10	–0.19
STANDARD & POOR'S 500 INDEX	448.29	450.91	2.62	0.58
N.Y.S.E. COMPOSITE	248.41	249.13	0.72	0.29
NASDAQ COMPOSITE	750.95	731.69	–19.26	–2.56

CLOSING QUOTES FOR GRAPH:

DATE	MICRO TIMES	DOW JONES
09/17/93	4212.67	3613.25
10/18/93	4473.13	3642.31
12/17/93	4644.25	3751.57
01/07/94	4866.50	3820.77
02/04/94	4728.74	3871.42
03/04/94	5081.75	3832.30
04/05/94	4878.26	3675.41
04/29/94	4639.86	3668.31

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REALIZABLE FANTASIES • BY JIM WARREN

Ask *Now*, for Online Political Disclosures

Notes on Taxing Knowledge

Computerized

California fantasies are sometimes digitally delicious; other times, downright stupid!

May Be Your Last Chance

Last year, a flood of faxes and letters encouraged the California Legislature to lead the nation in making legislative information available via the public computer nets, without state fees. The public support helped legislators override opposition from some of the most powerful people in the state.

This year, laudable legislators who want to make computerized campaign-finance disclosures available—already mandated in San Francisco and in federal races, and moving forward in New Mexico—again need our help.

Or—California can wait a year or two and become merely a simpering, limp-along follower of some more modern state. The question isn't *whether* California will provide online access to details about who's paying for our elected officials; the only question is *when.*

DISK- DELIVERING AUTHORS **MUST PAY SALES TAX; ONLINE** DISTRIBUTORS **DON'T.**

SB758 Is In Trouble

California Senate Bill 758 would authorize and mandate that candidates and campaigns file their already-required campaign-finance public disclosures in computerized form if they receive or spend more than $10,000 in a calendar year, and that the information be made freely available via the nonprofit, nonproprietary public networks. Its author is Senator Tom Hayden (D-Los Angeles; Aide Darryl Young, 916-445-1353, darryl.young@sen.ca.gov).

At press deadline, a key political player who has long worked for some of the state's most powerful politicians is recommending against SB 758. He has some legitimate concerns about excessive burdens on candidates and campaigns—but there are economical, technological solutions to his concerns that can easily be amended into the bill. (With luck, the opponent will find the solutions acceptable. If not, this column and online updates will report all the lurid details—especially emphasizing the political connections.)

Widespread public support can help make this much-needed political reform irresistible–IF it arrives in time.

Brief letters and faxes are needed, *now!* –supporting SB 758 and the prompt implementation of modern computer-aided access to political disclosures. The crucial next vote will soon occur in the Assembly Committee on Elections, Reapportionment and Constitutional Amendments. Fax or write at least to bill author Hayden (fax/916-324-4823); and also to the committee members. If you are near a member's district, zip off a brief letter to the editors of the local newspapers; they'd also like easier access to these hard-to-access disclosures.

The Committee members are:

- Diane Martinez (D), Chair, fax/916-324-1393, for Monterey Park, Alhambra, etc., around ZIP-code 918xx;
- Ross Johnson (R), voice/916-445-7448, for Fullerton, Placentia, etc., around ZIP-code 926xx;
- Tom Bates (D), fax/916-445-6434, for Oakland, Berkeley, Richmond, etc., around ZIP 946xx-948xx;
- Richard Mountjoy (R), fax/818-445-3591 [his District office], for Monrovia, Arcadia, Pomona, etc., around 910xx;
- Johan Klehs (D), fax/916-445-0967, for San Leandro, Hayward, Castro Valley, etc., 945xx; and,
- Cruz Bustamante (D), voice/916-445-8514 [newly-elected], for the Fresno area.

Sales Tax Bizzaro-Rama

The California Board of Equalization–threading several elephants through the eye of the state's wallet-sucking tax-needle –has decided that the method by which information is transferred determines whether the information provider is free of the state's sales-tax gouge, or will be taxed to the hilt, even if the information is transferred exclusively to resellers of the information.

If you create or compile information or listings (most sane people would call that "authoring") and transfer it by modem to one or several buyers—even thousands of eager end-users, each paying for your data-by-modem—then it's free of California's sales tax. At least according to a patient, seemingly-knowledgeable Board of Equalization Supervising Tax Auditor during an extended, detailed discussion of the matter.

But, if you dast to transfer identically the same information via a diskette or magtape to an online system for a fee, then you must pay and pay and pay sales tax on all that you are paid. (Then you get to pay income tax on whatever's left.) Even if you only transfer it to resellers of the information who have no personal use for it except for resale to the information's actual users.

Disk-delivering authors must pay sales tax; online distributors don't.

The lunatic issue appears to be whether you sold "tangible personal property"—i.e., a 50-cent diskette or coupla-dollar magtape. But the sales tax ain't on the cost of the diskette or magtape; it's computed on the total compensation you receive for the information that you sell, but only

continued on page 321

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486DX-50MHz w/256K VLB w/Intel CPU (ZIF)	538
486DX2-66MHz w/256K VLB w/Intel CPU (ZIF)	528
w/AMD CPU (ZIF)	488

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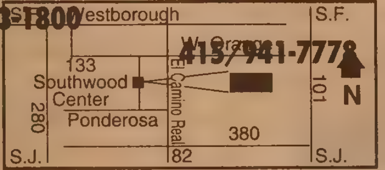

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VISA

BY GEORGE GLEASON

Encryption, Pragmatic And Principled

My company does business online. We're in telecommunications: telephony and computer network design, consulting, implementation, and service.

Some of our clients send their telecom service requests (TSRs) via Internet. We also send memos and discuss all manner of proprietary information among ourselves. Lately we've started sending business plans, spreadsheets, and performance reports to our investors and potential investors.

All of this deserves to be encrypted: to protect the privacy of our clients' data about their telephone and computer systems; to protect our proprietary interest in the things we discuss internally; and to protect our soon-to-be-stockholders' interest in our company's profitability and minimal risk exposure.

We believe encryption is needed to meet requirements for "due diligence" in protecting our interests. A misrouted TSR from a client is potentially as risky as a misplaced telephone calling card number. A sales strategy or spreadsheet, lost in cyberspace, is a potential time-bomb in the highly competitive sector of the telecom market we're about to enter. Encryption will mean an extra minute at the keyboard during every email session, but the minor inconvenience will also take a load off our shoulders by eliminating the uncertainties around our email. If I dyslex an Internet address, it won't matter. Finally.

Some time in the next quarter we're going to start using ViaCrypt ("licensed PGP"). Fortunately it's legal to export crypto into Canada, as one of our primary investor/partners is in British Columbia. At some point we may also be doing business with companies in Spain, and therein lies a problem: due to archaic Federal regulations, we can't send them ViaCrypt; they'll have to dig up PGP locally, and we'll need to have a reference copy to instruct them on use.

ViaCrypt Vs. Clipper

We chose our cryptosystem on merit rather than mandate, by which I mean we believe ViaCrypt is secure, and we do not believe the government-promulgated Clipper/Skipjack is secure. ViaCrypt is a combination of RSA key management with the IDEA cipher, which has been well studied and critiqued in the open peer review process. I personally know some of the people involved, and trust their skills and critical judgement. The Clipper/Skipjack algorithm is secret, and as such, won't be subjected to open peer review. The result is a system of questionable merit, which in our estimation is about as trustworthy as an automobile without an oil warning light. It might work most of the time, but when it goes wrong, the failure will be spectacular.

There shouldn't be any controversy surrounding a decision to opt for strong crypto, any more than there is about one's choice of backup storage media or the inclusion of uninterruptable power supplies in a bid for a telephone or computer system.

Now the Federal government wants to certify Clipper as a standard. To sugarcoat the pill, Federal certification could even protect users from liability in the event Clipper is compromised. So for example, if a client sends me a Clippered TSR and organized crime cracks our email server, de-Clips the message, and uses the information to crack the client's PBX for $50,000 worth of calls to Colombia...well, hey, no problem, Uncle Sam says we're not liable. Now if Uncle Sam wanted to go so far as to cover the amount of the actual damages, we still wouldn't be persuaded: there would still be harm to our relationship with our client, and plenty of suffering to go around while the mess is being sorted out. In our opinion, liability is a legal abstraction for pinning blame on some convenient target. Blame doesn't exist in nature, but damage does: we're interested in preventing the actual damage.

Federal agencies are pushing Clipper for the sole reason that they want an encryption system they can break into, and more insidiously, they want one that tags every message, in cleartext, with information that can be used for traffic analysis. If you don't know what traffic analysis is, you'd better find out, because it's the up-and-coming means by which Big Brother will be watching you more than ever before.

Once the government has the bureaucratic and technical infrastructure

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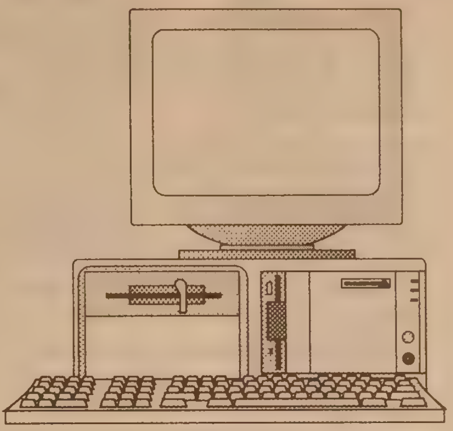

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BEST Price Performance $1,799

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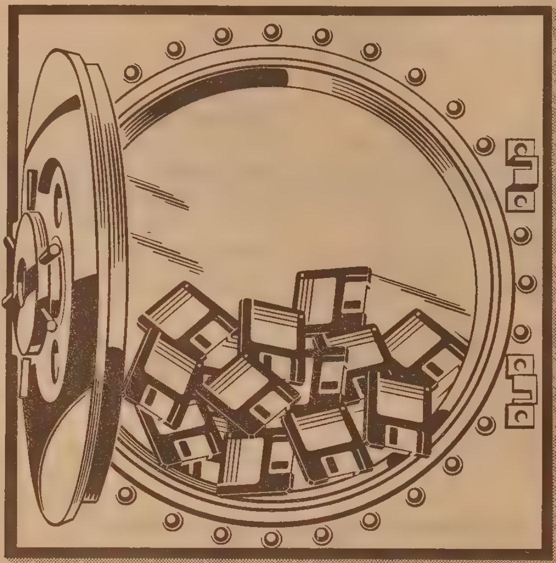

We believe encryption is needed to meet requirements for "due diligence" in protecting our interests. A misrouted TSR from a client is potentially as risky as a misplaced telephone calling card number. A sales strategy or spreadsheet, lost in cyberspace, is a potential time-bomb in the highly competitive sector of the telecom market we're about to enter.

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in place for surveillance of Clipper, there will be a strong incentive to resist admitting it when Clipper is finally compromised; whether by organized crime, rogue elements within law enforcement, or some smart college kid. The result will be a clearly bad standard remaining in place through force of inertia or perhaps through force of law, and a private sector software industry in a poor state of preparedness to come up with a replacement. This is something we do not want any part of.

Imagine, by comparison, a car with seatbelts and airbags which save your life if you crash at 55, but are required to fail at higher speeds as a "disincentive" to "criminals" who exceed the posted speed limit. Or, more to the point, how about a building code that limits the strength of earthquake bracing so it doesn't interfere with the ability of law enforcement to break down the walls with a battering ram if they suspect a dope deal...?

We believe that we should be able to exceed such "lowest common denominators" as a matter of principle as well as pragmatic business reality. Frankly, there shouldn't be any controversy surrounding a decision to opt for strong crypto, any more than there is about one's choice of backup storage media or the inclusion of uninterruptable power supplies in a bid for a telephone or computer system.

Finally, I am suspicious of the government's attempts to control a necessary tool of commerce and communication as if it were a major threat. Consider what would happen if, for example, all photocopiers were kept under lock and key, and under the constant vigilance of officials ever suspicious of the possible duplication of some threatening manuscript. That was exactly the policy in the old Soviet Union of the Brezhnev regime, and just look where it got them. ■

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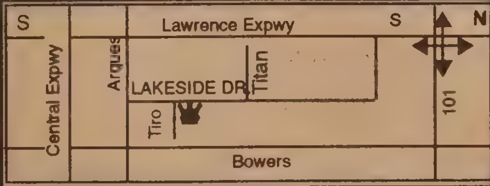

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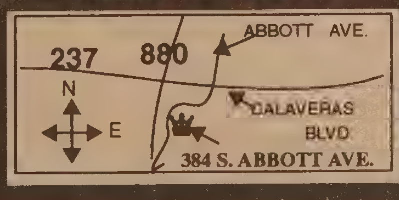

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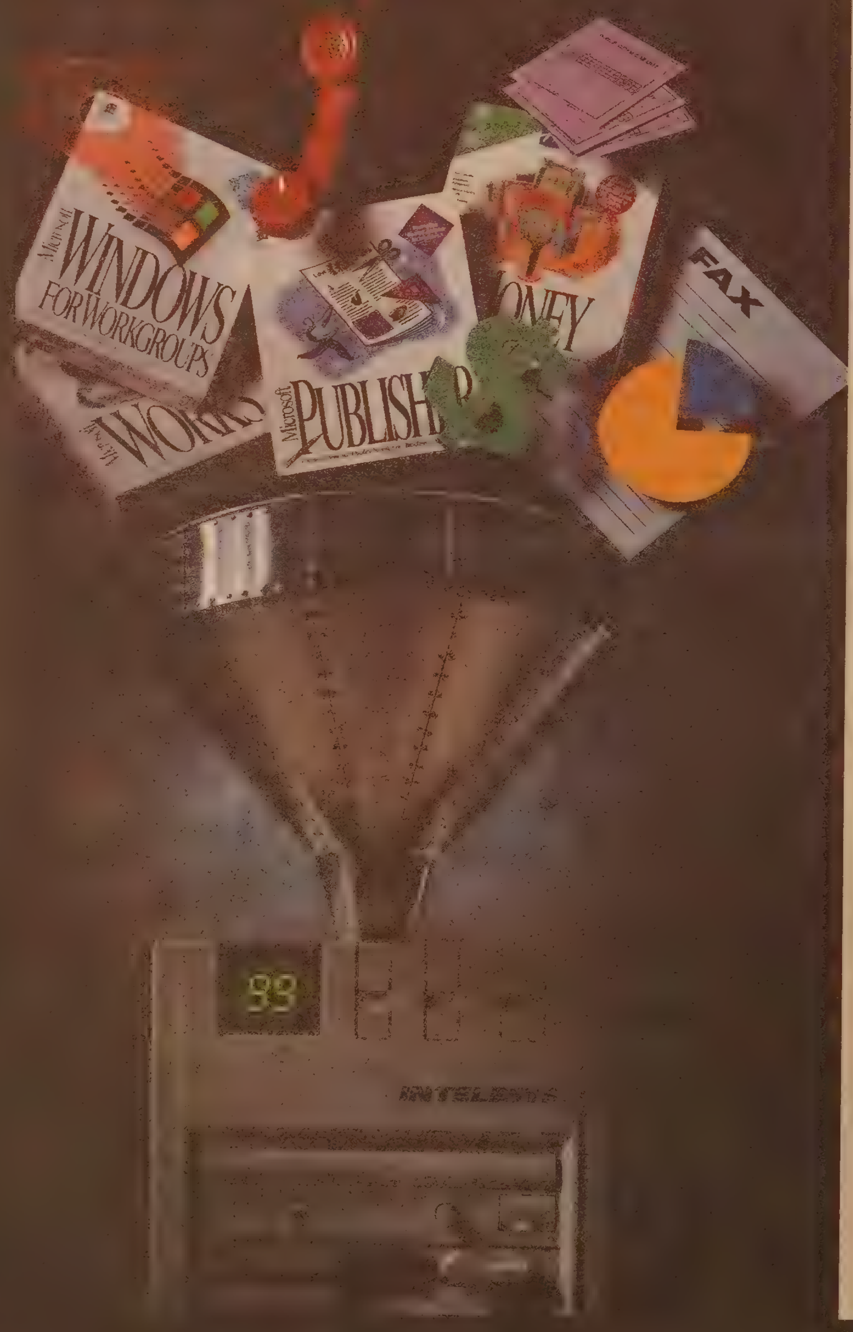

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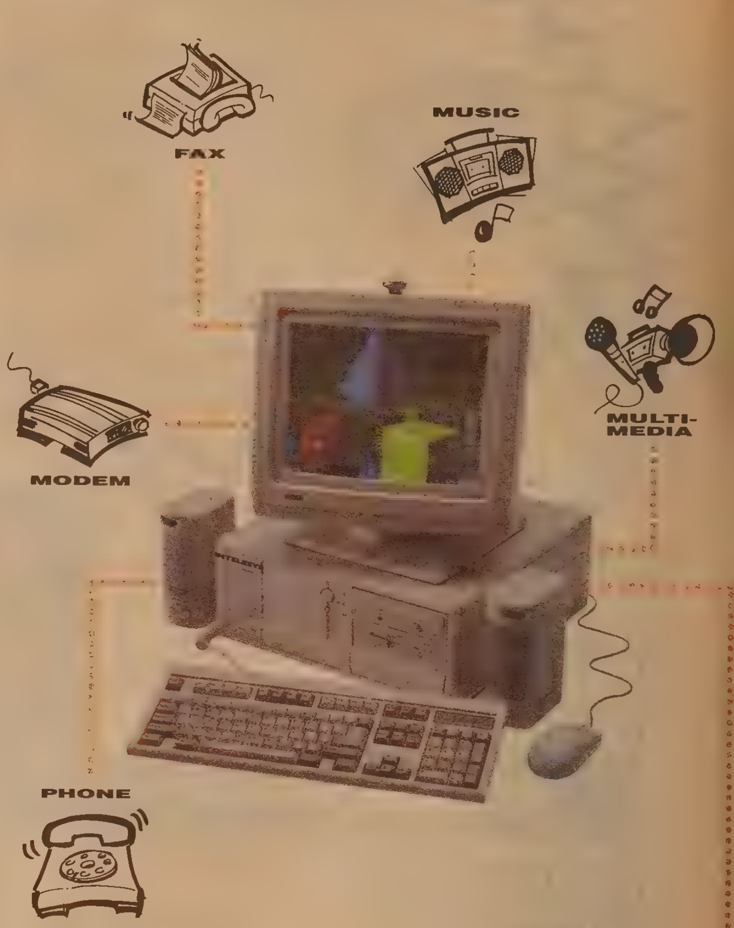

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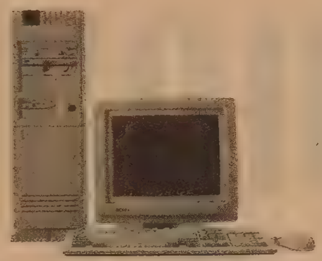

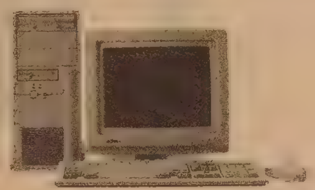

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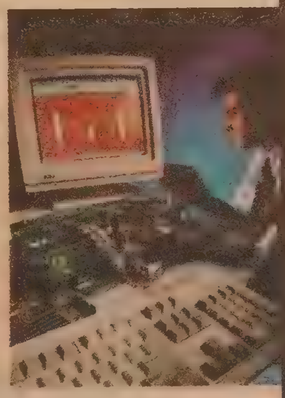

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Multimedia Benefit For Glide's Computers & You

By Cynthia Johnston

June 17 Cyber Circus To Fund Training Programs

On Friday, June 17, from 7 pm to midnight, Glide Memorial Church (330 Ellis Street in San Francisco) will host The Computers & Humanity Cyber Circus.

This is the second annual fundraising benefit for Computers & You, a nonprofit computer learning center which makes computer technology, including multimedia, available to homeless and underprivileged children and adults. Founded in 1989 by David Bunnell, Pat McGovern, and the Reverend Cecil Williams, the computer learning center occupies the entire sixth floor of the Glide building.

Inspired by the idea that computers offer people benefits beyond traditional classroom teaching, over fifty volunteer instructors teach classes in subjects ranging from basic DOS to spreadsheets and accounting programs to desktop publishing. Over sixty computers are available on-site, including IBMs, Macs, and Apple IIs; there's also an impressive and growing software library and a music room, where students learn to write and play music using MIDI (Musical Instrument Digital Interface).

In five years Computers & You has trained over five thousand students, at a growing rate now at more than 250 per quarter. Courses are offered in computer literacy and job-related skills, as well as general literacy courses such as basic math, reading, composition, social studies, music, and art.

Changing Lives In The Tenderloin

Although the learning center is a resource for people all over the Bay Area who have no other access to computers, most of the students come from the surrounding inner city "Tenderloin" neighborhood. They find their way to Computers & You through recovery programs, homeless shelters, food lines, community organizations, and word of mouth.

The learning center aims to break the cycle of poverty by empowering the indi-

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Landmark speed: 65/55

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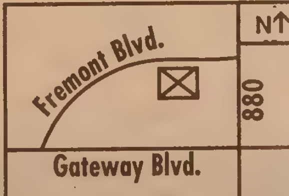

vidual. And it's working. Thirty-eight percent of Computers & You graduates have gone on to get jobs as a result of their computer training.

John Proud, a Computers & You "success story," spoke at last year's benefit and described the process of self-empowerment: "Several years ago I woke up in a hospital with most of my memory gone. I was a commercial designer who didn't know what the color white was. Or red."

He spent the next several years wandering the streets, "wondering what the color red was. I was in a fairly critical state by the time I heard of Computers & You. I went in and I started to study programs, which doctors had already explained to me I could never study, because I could never learn again."

But he did start to learn, or at least go in the classes. He was terrified, knowing that clumps of his memory just weren't there. He never mentioned his fears, and kept "fighting an inside battle to go into PageMaker, Illustrator, and other programs. They were there constantly with teachers to help me, with services that I could not possibly have afforded in any way."

Finally, at age 55, he applied for a job at an insurance company to work in the mailroom. "Try that on your ego sometime. But it was a job. It was the first job I had had in six years. And I had it because of Computers & You.

"There are hundreds, thousands of people just like myself, who, through some crisis in their life, maybe through a crisis like never having had anything in their life, stumble onto, or run into Computers & You. It gives each the same benefit. It teaches to reach out into society, but no longer with an open hand. Now it's a hand with a very definite skill, and the belief that you can use it."

In addition to the volunteer instructors, a handful of young students have been trained as peer tutors in computer skills. After being trained themselves, they help teach other students, earning a small income. The responsibilities they take on at the learning center help them deal with their responsibilities at home.

Without a program like Computers & You, some of these children might face homelessness. Poverty threatens to hold them back. The tutoring program provides a degree of independence and an opportunity to take care of their own needs, or to help out at home, or both. They enjoy working at the center, where they feel needed and supported. Most importantly, they are developing the confidence and self-esteem they need to handle the other challenges they must face.

The Cyber Circus Fundraiser

Billed as "the greatest show in technology" and "a dazzling extravaganza of technology and live entertainment," the Cyber Circus promises amazing sights, amazing sounds, and exotic foods. "Experience the brightest minds in the computer/multimedia industry...the greatest effort in the industry to support the landmark program that really helps people through technology."

This year's event features live music from big-name bands, members of the Pickle Family Circus, the Glide Vocal Ensemble, circus delights from around the world, an interactive sideshow, live interactive video, virtual realities, plus a gourmet feast. Tickets are $100 (tax-deductible contribution with all proceeds donated to Computers & You). Call (415)715-6204 for ticket or sponsor information. ■

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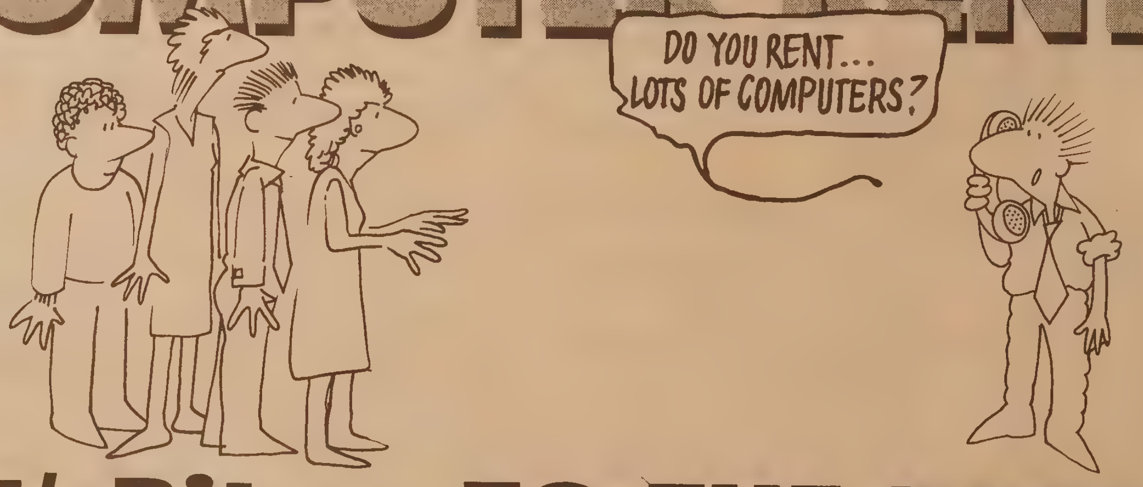
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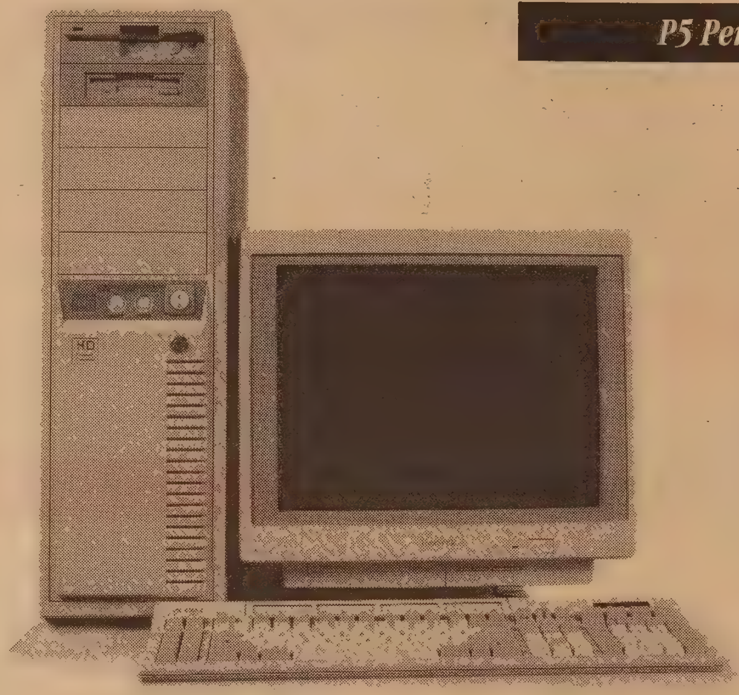

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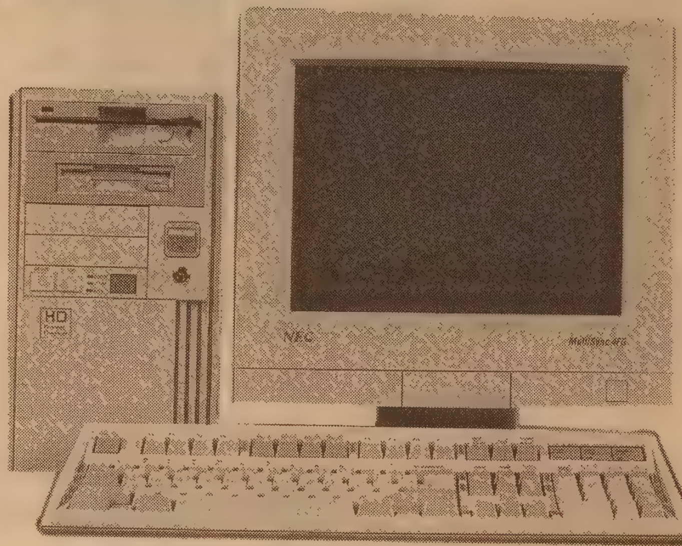

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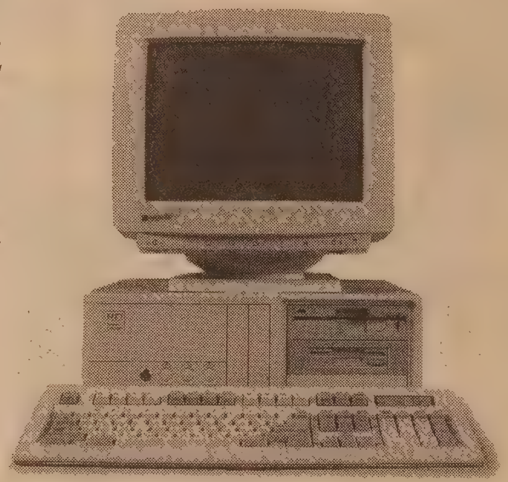
NETWORK SYSTEMS

Design, Consultation, Installation, Trouble Shooting, Hardware & Software Configuration, Service & Support

HD Workstation

- *Desktop Case w/ 200W Power Supply*
- *Intel 486SX 25 Processor*
- *ISA/VESA Motherboard*
- *4MB RAM (Max 32MB)*
- *128K High Speed External Cache (Max 256K)*
- *TEAC 1.44MB Floppy Drive*
- *VESA Local Bus 32-bit Video Card/1MB*
- *14" Non-interlaced Monitor*
- *101 Enahnced Keyboard*
- *Microsoft Serial Mouse*
- *Free Mouse Pad*
- *NE-2000 Compatible Ethernet Card (Coax or 10Base-T)*

$875



Graphics. Engineering Workstation

- *Tower Case w/ 300W Power Supply*
- *Intel Pentium Processor*
- *PCI/VLB Pentium VLB Motherboard/512K Cache*
- *16MB Ram (Max 128MB)*
- *Teac 1.2MB and 1.44MB Floppy Drives*
- *1.0GB SCSI II Hard Disk*
- *Adaptec PCI SCSI II Controller Kit*
- *64-Bit VLB Windows Accelerator Card /2MB*
- *Toshiba Internal CD-ROM*
- *Viewsonic 20" Monitor*
- *Focus 9000 Keyboard*
- *Microsoft Serial Mouse*

$Call

Pentium/HD File Server

- *Tower Case w/ 300W Power Supply*
- *Intel Pentium 90MHz Processor*
- *PCI/VESA Motherboard*
- *16MB Ram 72PIN (Max 128MB)*
- *256K High Speed External Cache (Max 512KB)*
- *Teac 1.2MB Floppy Drive*
- *Teac 1.44MB Floppy Drive*
- *1.75GB SCSI II Hard Disk*
- *Adaptec 2842 VESA SCSI II Controller Kit*
- *Diamond Stealth 32 PCI Video Card/1MB*
- *14" non-interlaced monitor*
- *101 Enhanced Keyboard*
- *Microsoft Serial Mouse*
- *Free Mouse Pad*

$3995

Novell Labs Tested & Approved

SCO

SCO Certified™

intel inside®

It's your serve! New workstations from HD Computer will put you in the Winner's Circle. These little systems are loaded with features. Where else can you find complete network stations for under $1000?

With the extraordinary performance, HD Computer Systems allow you to race through heavy/intensive or demanding network environments. Accessing large amounts of data at high speed is the standard.

HD Computer offers unparalleled custom system configurations. When it comes to the best, the fastest and the most cost-effective, no one beats HD Computer network system solutions.

We can now run UNIX, NT, NEXTSTEP...

HD

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Sales Hours: 9:00AM - 6:30PM Weekdays, 10AM - 6PM Saturdays (Pacific Time)

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Tel: (415) 434-8118/Fax: (415) 434-8128
500Washington St., San Francisco, CA 94111

El Cerrito
Tel: (510)528-0753/Fax: (510) 528-0757
10005 San Pablo Ave., El Cerrito, CA 94530

Sacramento
Tel: (916) 483-4278/Fax: (916) 483-4826
2530 Watt Ave., Sacramento, CA 95821

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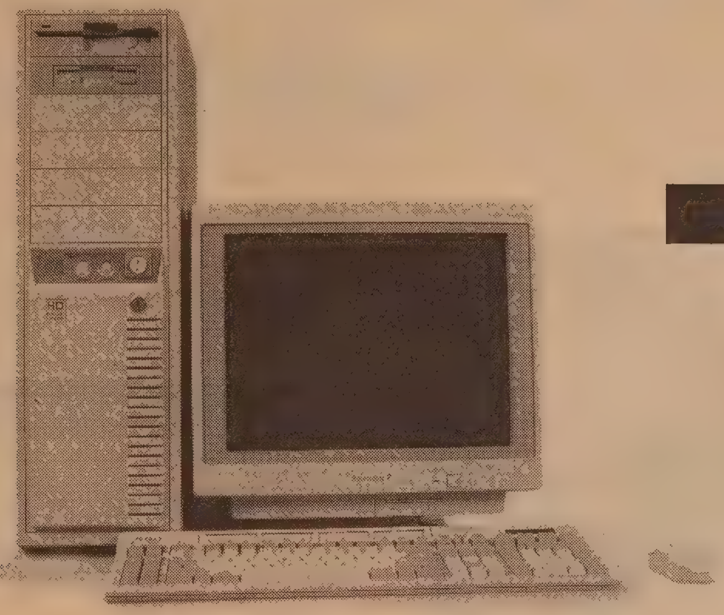
NETWORK SYSTEMS

"We Stand Behind Our Technology, Quality and Service"



intel inside

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Ethernet Adapters

- *DANPEX*

EN-2000B 16Bit BNC	*$65*
EN-2000BT 16Bit Combo	*$85*
EN-2000PB 16Bit Soft Set BNC	*$60*
EN-2000PT 16Bit Soft Set 10BT	*$60*
EN-2000P3 16Bit Soft Set Combo	*$75*
EN-6000B Pocket Lan BNC	*$137*
EN-6000T Pocket Lan 10BT	*$140*
EN-400I 4Port 10BT Hub Card	*$150*
EN-800A 8Port 10BT Hub	*$215*
EN-1212A 12Port 10BT Hub	*$485*

- *Accesories*

RG58 Coax Cable BNC 10'	*$8.00*
RG58 Coax Cable BNC 25'	*$10.00*
RG58 Coax Cable BNC 50'	*$13.00*
RG58 Coax Cable BNC 100'	*$25.00*
BNC Straight Adapter F-F	*$1.80*
BNC T Adapter F-M-F	*$3.80*
BNC Terminator 50 OHM	*$2.20*
BNC Connector Crimp on RG58	*$1.80*
BNC Connector Mold	*$2.00*
Gender Change DB25 F/F, M/M	*$4.00*
Gender Change Cent .36 F/F, M/M	*$7.00*
Gender Change DB25 to Cent .36	*$5.00*
Gender Change DB9 to DB25	*$4.00*
Gender Change DB9 to Din6	*$5.00*
RG58 A/U Coax Cable 1000	*$125.00*
RJ45 8 Twist Pair Cable 1000'	*$110.00*
RJ45 8 Twist Pair Cable 10'	*$3.50*
RJ45 8 Twist Pair Cable 25'	*$4.50*
RJ45 8 Twist Pair Cable 50'	*$9.50*

- *Microdyde/Novell*

NE-2000 Plus 16bit	*$115*
NE-2000T Plus	*$115*
NE-3200 EISA 32bit Coax/TP	*$539*
NE-2000 Plus 3	*$129*

Ethernet Adapters

- *Compatible*

NE-1000 8bit Coax	*$59*
NE-2000 16bit Coax/TP	*$60*
NE-2000 16bit Combo	*$75*
NE-2000 16bit 5 pack	*$235*
EP-888A Pocket Ethernet BNC + 10BT	*$145*
EP-808A 8Port Ethernet HUB	*$199*
EC-812 12Port Ethernet HUB	*$449*
EE-840 32Bit EISA Ethernet	*$289*

- *Intel*

Etherexpress 16 16bit 5pack/20pack	*$575/1995*
Intel 16bit Ethernet Combo PCLA 8100	*$129*
Intel 16bit Ethernet BNC PCLA 8110	*$115*
Intel 16bit Ethernet 10BT PCLA 8120	*$115*
Intel 16bit Ethernet Combo PCLA 8105/Flash	*$159*

- *3COM*

3C503 Etherlink II 16 Coax/TP	*$175*
3C503 Etherlink II 16 5pack	*$785*
3C507 Etherlink II 16 Coax/TP	*$295*
3C509 Etherlink III Coax/TP	*$145*
3C509 Etherlink III 5pack	*$645*

- *SMC*

Ether card plus elite 16 Coax/TP	*$119*
Elite ultra 16bit Coax/TP	*$115*
Elite ultra 16bit 6pack/24pack	*$675/2375*
SMC Ultra 16 Bit Ethernet Combo	*$135*

- *DLINK*

DE-600 TP Pocket Ethernet 10BT	*$199*
DE-205 TP 16Bit Ethernet 4 Port 10BT	*$290*

• *4 Port 10 Base-T Hub Card*	*$150*
• *8 Port 10 Base-T Hub*	*$215*
• *12 Port 10 Base-T Hub*	*$485*

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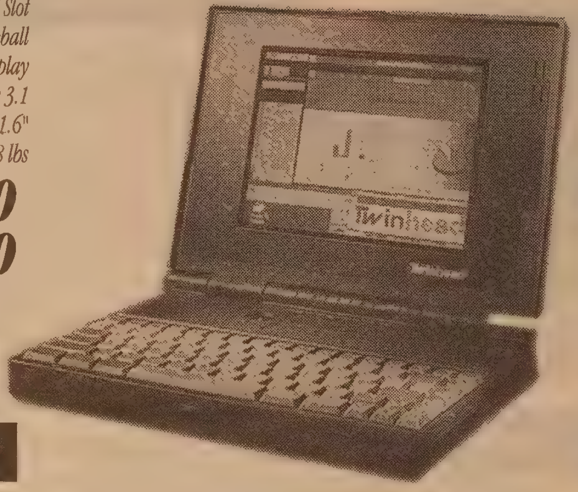
NOTEBOOK

Twinhead Powerful Slimnote

- Intel SL Enhanced Processor
- 4MB RAM Expandable to 20MB
- 1.44MB Built-in Floppy Disk Drive
- 84 Keys Keyboard
- PCMCIA Type II Slot
- Built-in Trackball
- 10" VGA/Mono Display
- MS DOS 6.2, MS Windows 3.1
- Physical Dimensions 8.5" x 11" x 1.6"
- Weight with Battery 5.8 lbs

486DX-33 w/200MB HD	**$1730**
486DX2-66 w/200MB HD	**$2150**



- Intel SL Enhanced Processor
- 4MB RAM Expandable to 20MB
- 1.44MB Built-in Floppy Disk Drive
- 84 Keys Keyboard
- 256 Color Display/512K RAM
- PCMCIA Type II Slot
- Built-in Trackball
- MS DOS 6.2, MS Windows 3.1
- Physical Dimensions 8.5" x 11" x 1.8"
- Weight with Battery 6.3 lbs

486DX-33 w/200MB HD Dual Scan Color	**$2395**

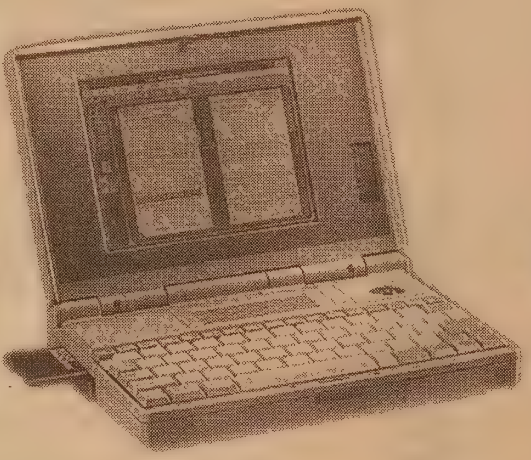
Twinhead Brilliant Color Notebook

486DX-33 w/200MB HD Active Color	**$2950**
486DX2-66 w/200MB HD Active Color	**$3570**

MTC-4020 Color Notebook

- Intel 486SX-33 CPU
- 4MB RAM Expandable to 20MB
- 130MB IDE Hard Disk
- One Serial Port, One Keyboard/Mouse Port
- One External VGA Connector
- One PS II Keyboard/Mouse Connector
- 85 Keys Keyboard with Inverted " T" cursor Keys
- Build-in 1.44 MB Floppy Disk Drive
- Built-in 16mm Trackball
- Preloaded with Microsoft DOS and Windows
- 11" (W) x 8.5" (D) x 1.9" (H)/5.5lbs

$1815



PCMCIA

XIRCOM. Creditcard Ethernet Adapter
- Convenient Network Connection VIA the PCMCIA Slot

$289

ADAPTEC SLIM SCSI
- 16 Bit PCMCIA-To- SCSI Host Adapter

$289

• Pocket Lan Coax (for notebook)	**$137**
• Pocket Lan 10 Base-T (for notebook)	**$140**
• 14400 Fax/Moden Mini-Pocket (for notebook)	**$229**

Twinhead 4 Pounds Powerful Subnote

- 4MB RAM Expandable to 8MB
- 1.44MB External Floppy Disk Drive
- 8" Side lit VGA display, 64 shades
- 85MB IDE Hard Disk
- 79 Keys Keyboard
- 64 Gray Shades VGA Display
- PCMCIA Type II Slot
- Built-in Trackball
- MS DOS 6.2, MS Windows 3.1
- Physical Dimensions 7.1" x 10" x 1.6"
- Weight with Battery 4 lbs

486SLC-33 Only	**$1410**

Accesories

• Mini-Pocket 14.4 Fax Modem	**$229**
• Dlink DE-600TP Pocket Ethernet	**$199**
• Dlink EN-6000B Pocket Lan BNC	**$137**
• Danpex EN-6000T Pocket Lan 10BT	**$140**
• EP 888A Pocket Lan BNC + 10BT	**$145**

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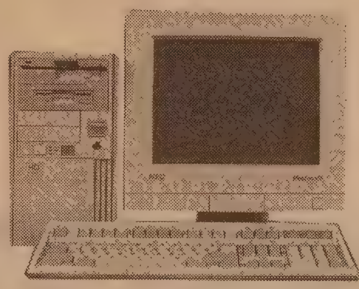
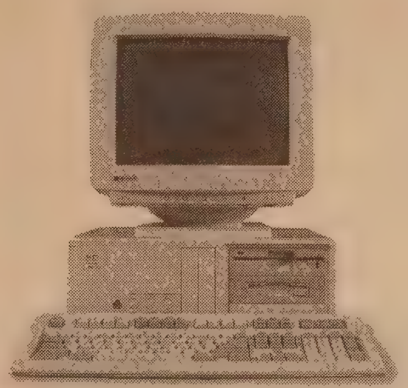
GENERAL/BEST BUY SYSTEM

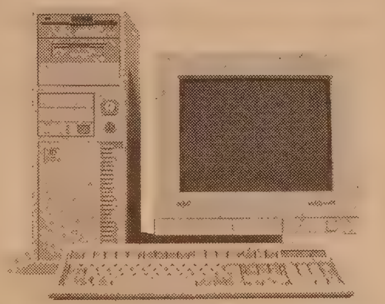
ISA DX-50 Windows Accelerator System

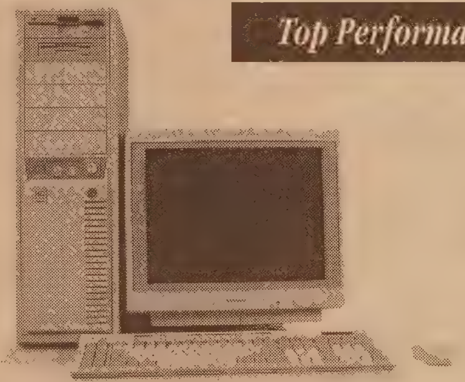
- Intel 486 Processor
- 128KB Cache (Max. 256KB)
- 4MB RAM (Max. 32MB)
- 1.2MB FDD
- 1.44MB FDD
- **424MB IDE HDD**
- 2H/2F IDE Disk Controller
- 2S, 1P, 1G Ports
- 16-bit Windows Accelerator Card/1MB
- Mini-Tower Case w/ 200W Power Supply
- 14" Non-interlaced Monitor, .28 dpi
- 101-key Enhanced Keyboard
- 3 Button Serial Mouse
- Free Mouse Pad
- Free Software Option

DX-50	**$1425**









- Intel DX-486 Processor
- ZIF Socket OverDrive Ready
- 8KB Internal Cache
- 256KB External Cache
- 4MB RAM (Max. 128MB)
- 1.2MB FDD
- 1.44MB FDD
- 32-bit EISA SCSI II Controller
- 2 16550 UART High Speed Serial Port
- 1 Parallel Port
- 345MB SCSI HDD
- Tseng Lab ET-4000 W32 VL-B Graphic Accelerator Card/1MB
- Mid Tower Case w/ 230W Power Supply
- 14" ViewSonic 6E Non-interlaced Monitor

Top Performance EISA/VESA System

- 101-key Keytronic Keyboard
- 3 Button Serial Mouse
- Free Mouse Pad
- Free Software Option

DX-33	**$2095**
DX-50	**$2185**
DX2-66	**$2195**

intel inside®

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SCO Certified™

486 System 386 Price

HD 486 System Below $1000

- Intel SX 486 Processor
- 128K Cache
- 4MB RAM (Max. 32MB)
- 1.44MB FDD
- 270MB IDE HDD
- 2H/2F IDE Disk Controller
- 2S, 1P, 1G Ports
- 16-bit SVGA Card/1MB
- Mini Tower Case w/ 200W Power Supply
- 14" SVGA Monitor, .39 dpi
- 101-key Enhanced Keyboard
- 3 Button Serial Mouse
- Free Mouse Pad

486SX-25	**$975**
486SX-33	**$999**

With Purchase of New System only

M.S. DOS 6.2	**$45**
M.S. Windows 3.11	**$48**
M.S. Windows for Workgroups ADD on 3.11	**$58**

Free Software Option:

- PFS: Windows Works
- PFS: Publisher
- PFS: Prospect
- PFS: First Choice
- CD Title: Toolworks Encyclopedia

HD Computer continues to offer leading, high-performance system configurations for any application. Custom configuration. Lifetime technical support. 30-day money back guarantee. No other Bay Area system integration house can boast this type of service and support.

HD's new EISA/VESA systems, 386 systems and Windows Accelerator systems are only a few of the many system configurations now offered by HD Computer. Whether for business or at home, HD will custom build the computer systems to your specifications.

We can now run UNIX, NT, NEXTSTEP...

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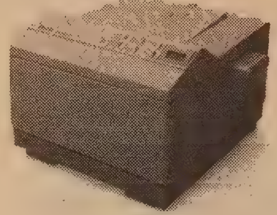
3.5" DS/HD Disk 25 pack $9.99

Printers

HEWLETT PACKARD

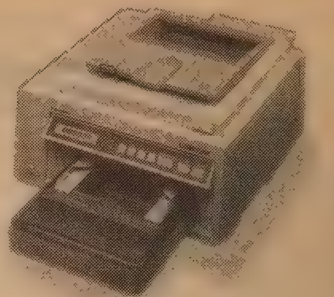
HP DeskJet 520	$295
HP DeskJet 560C	$569
HP LaserJet 4	$1365
HP LaserJet 4P	$969
HP LaserJet 4L	$639
HP LaserJet 4M	$1895
HP4+ *New!*	$1399
Memory upgrade for HP Printer	$48/MB



ALPS LSX 1000 Laser Printer $1190

Panasonic
Office Automation OA

2123	24-pin	$239
2124	24-pin	$319
3624	24-pin Quiet	$399
4430	Laser 1MB	$669
4450	Laser 10ppm	$1039
4455	Laser 2MB	$1439



Mouse, Joystick & Scanner

Microsoft Serial Mouse (OEM)	$34.00
Microsoft Bus Mouse (OEM)	$59.00
Logitech MouseMan (Serial)	$55.00
Logitech Bus Mouse	$65.00
Logitech Trackball	$74.00
Logitech ScanMan Easy Touch	$199.00
Logitech ScanMan 256 w/ Omni Page	$189.00
Logitech CyberMan 3D Mouse	$79.00
Z-Nix Cordless Mouse	$28.00
3-Button Serial Mouse	$9.90
Joystick	$14.00
Mouse Holder	$2.50
Mouse Pad	$2.50

Keyboards

101-Key Enhanced Keyboard	$29
Keytronic 101	$36
OMNI101/102/Ultra (Northgate)	$98
Focus 9000 129 Keys Programmable	$65
Focus 8000 111 Keys w/ Calculator	$55
Focus 7000 With Track Ball	$59
Focus 2001 Click 101	$42
ProXellent 121 Keys Programmable (White)	$79
ProXellent 121 Keys Programmable (Black)	$89
KB-5181 Mechanical Firm Click	$35
KB-5311 101 Keys Membrane	$25
KB-5591 Trackball Keyboard	$49
PN501 Plug N' Save	$59

Okidata Printers

OL-400e LED Page Printer

- Compact size and sleek design fits on any desktop
- 4ppm with RISC microprocessor
- 44 fonts
- Compatible with virtually all software applications

$497

OL410e

- 600 dpi
- 4ppm

$687

Accessories

3.5" DS/HD Disk	25 pack	$9.99
5.25" DS/HD Disk	25 pack	$7.50
3.5" DS/HD	10 Pack 3M	$8.50
5.25" DS/HD	10 Pack 3M	$8.00
DC-2120	3M	$13.00
Power Center	UL	$18.00
Power Strip	Plastic, UL	$5.00
Disk Box	5.25 x 100	$6.00
Disk Box	3.5" x 80	$6.00
Data Switches	DB25AB	$8.00
Data Switches	DB25 ABCD	$16.00
Monitor Filter	14" Glass	$10.50
Dust Cover	CPU and Monitor	$5.00
Disk Clean Kit	5.25" or 3.5"	$2.50
Printer Cable	6'/10'	$3.00/$6.00
Printer Cable	15'/25'	$7.00/$9.00
RS232	DB25 10'/25'	$6.00/$10.00
Keyboard Ext. Cable	6'	$3.00
Modem Cable		$4.00
SCSI I/SCSI II Cable		$11.00/$40.00
14" Color Monitor Filter		$8.00
14" Anti-Glare Filter		$29.00
Printer Stand		$9.00

And More...

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Monitors

SONY

CPD 1730	17" SVGA	.25 dpi	$995
GDM 17SE1	1600 X 1280	.25 dpi	$1172
GDM2038	20" State of the Art		$2185

PROTON

PM-1440	14", 1024, .28mm Interlaced, Full Screen H. Freq. 30-40 KHz	$238.00
PM-1448	14", 1280, .28mm Non-interlaced, Full Screen H. Freq. 30-48 KHz	$258.00
PM-1440A	14", 1024, .28mm Interlaced, Full Screen with Built-in speakers, H. Freq. 30-40 KHz, Audio Function	$285.00
PM1440B	14", 1024, .28mm Interlaced, Black Monitor H. Freq. 30-64 KHz	$285.00
PM-1448B	14", 1280/.28mm Non-interlaced, Black Monitor H. Freq. 30-45 KHz	$295.00

KFC

CT1428A	14" SVGA, .28mmDP, 1024x768 N/I	$255
CA1511	15" Flat Screen, .28mmDP, 1280x1024 N/I	$395
CA1507	15" Flat Screen, .28mmDP, 1280x1024N/I Digital Controls, Power Saving	$419
CA1712	17" Flat Screen, .28mmDP, 1280x1024, N/I	$740
CA1718	17" Flat Screen, .26mmDP, 1280x1024 N/I Digital Control, Power Saving	$785

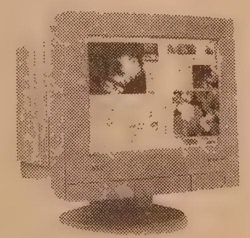
NOKIA (IBM and Mac)

449E	15" Max-80Hz	.28dpi Digi Control	1024x768 Green Monitor	$515
447B	17" Max-110Hz	.26dpi Trinitron Digi Control	1280x1024	$965
445M	21" Max-120Hz	.26dpi Digi Control	1280x1024 Green Monitor	$2069
445X	21" Max-120Hz	.26dpi Digi Control	1600x1200 Green Monitor	$2698

Impression

14" SVGA	.39 dpi, 1024x768	$219
14" SVGA	.28dpi, 1024x768	$245
14" Non-interlaced SVGA	.28 dpi, 1024x768	$259
Impression 17"	Non-interlaced SVGA	$699

NEC



JC1431	14"	1024x768	$319
3V	15"	1024x768	$473
3FGe	15"	1024x768 @ 60Hz	$565
4FGe	15"	1024x768 @ 76Hz	$629
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5FGp	17"	1280x1024 (with Opticlear)	$1129
6FGp	21"	1280x1024 (with Opticlear)	$1999

NANAO

F550i	17"	Non-interlaced	1280x1024	.28 dpi	$939
F550iw	17"	Non-interlaced	1280x1024	.28dpi	$1039
F560iw	17"	AKA: the Green Monitor			$1323
T560i	17"	Non-interlaced	1280x1024	.25 dpi	$1623
T660i	20"	Trinitron Tube	1280x1024	.28 dpi	$2373
T750i	21"	Non-interlaced	1280x1024	.32 dpi	$1989
F760i	21"	80x1024 @ 74Hz		.31 dpi	$2095

ViewSonic *The New Generation*

ViewSonic 6E	14"	.28dpi Non-interlaced	$280
ViewSonic-15	15"	.28 dpi 1280x1024 Non-interlaced, 76Hz at 1024x768, Flat Screen	$445
ViewSonic-17	17"	.28 dpi 76Hz at 1280x1024, Non-interlaced, Flat Square Screen	$975
ViewSonic-20	20"	.28 dpi 1600x1280, Non-interlaced, Dual Page Display	$1575
ViewSonic-21	21"		$1825

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MX17FG	17" 1280 X 1024, Flat Screen .26	$845
DX17F	17" 1280 X 1024, Flat Screen .26	$745
MX15F	15" Non-interlaced, 1280 X 1024, Flat Screen .28	$495
DX15F		$445

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1542C+	Bus Master Kit with Corel SCSI	$312
2742	EISA Kit 14HDS	$364
2842	VESA Kit Fast SCSI II	$285
1510ACDK	For CD ROM	$95
2940/2	PCI SCSI	$295

AMI

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FastDisk EISA Caching Controller up to 16MB	$389
FastDisk VLB VESA Local Bus Caching Controller	$393

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DTC 2278	VLB IDE	$39
DTC 3280	ISA SCSI	$139
DTC 3290	EISA SCSI Cache	$499

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EPP Mini SCSI	$209

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BT445S	VESA SCSI-II Kit	$274
BT545KT	Bus Master Fast SCSI	$208
BTB742KT	EISA SCSI-II Kit	$315
BTB747AK	EISA Fast SCSI Kit	$364
KT946C	PCI SCSI Kit	$295

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DC-200M	ISA IDE/512K	$124
DL-420	VLB IDE/512K	$108
DC-4030	4F/2H VLB Cache	$119

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graphics Pro Turbo PCI or VLB 2MB/4MB	$459/729
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Stealth Pro 1MB/2MB VLB	$255/335
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Stealth 24 VESA or ISA 1280x1024	$155
Viper VLB 2MB VRAM Accelerator	$365
Viper PCI 2MB VRAM Accelerator	$428
Diamond Stealth 32 PCI 1MB/2MB	$199/245

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ET-4000 W32P PCI	1MB/2MB	$195/$225
ET-4000	1MB ISA True Color	$95
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Cirrus Logic 5426 VLB	1MB	$95
Cirrus Logic 5428 VLB	1MB	$99
UMC VLB VGA	1MB Built-in IDE/2S1P1G	$115
WD Chipset ISA	1MB	$95

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9GXE L-16		$895
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Pentium PCI/60/66	Mercury, ISA/PCI, 256K up to 512K, 0MB up to 128MB, 72-pin RAM	$495
Pentium VLB/66/60	OPTI, ISA/VLB, 256K up to 512K, 0MB up to 192MB, 72-pin RAM	$425
Pentium PCI/EISA	Intel, 66/60, ISA/PCI/EISA, 256K up to 512K, 0MB up to 192MB, 72-pin	$485
486PCI Local Bus	Saturn, 66/60, ISA/PCI, 256K up to 512K, 0MB up to 128MB, 72-pin, Built-in IDE & High Speed serial port, 1 parallel port	$315
486VLB/DX4	SIS, ISA/VLB, 256K up to 1MB, 0MB up to 64MB, 72-pin, support 5V & 3.3V, any speed CPU, Green	$195
VESA 72-Pin	SIS, ISA/VLB, 128K up to 1MB, 0MB up to 64MB, 72-pin, Green	$165
VESA/USA	Made in USA, 8 ISA, 2 VESA Slots, Contaq-A Chipset, ZIF Socket, 128K Cache up to 256K, 0MB RAM up to 128MB	$125
EISA/VESA	8 EISA, 2 VESA Slots, Zif Socket, AMI BIOS, 256K Cache up to 1MB, 0MB up to 256MB	$295
EISA/VESA	7 EISA, 1 VESA Slots, SIS Chipset, AWARD BIOS, 256K Cache, 0MB up to 128MB	$285

Micronics

VESA Local Bus/256K/DX-33 CPU	$649
VESA Local Bus/256K/DX2-66 CPU	$759
JX30 VESA Local Bus/256K/DX2-66 CPU	$864
EISA VLB/256K/DX-33 CPU	$845
EISA VLB/256K/DX2-66 CPU	$955
PCI/256K/33/66	$685/795

AMI Motherboard

Enterprise III EISA/VESA /256K/33/66 CPU	$865/975
Enterprise IV EISA/VESA /256K/33/66 CPU	$745/855
Super Voyager VL-B/256K/486DX-33/66 CPU	$595/705
Excalibur Pentium VLB MB 512K/60Mhz CPU	$1595
Excalibur Pentium EISA PCI 256K/60MHz CPU	$1685
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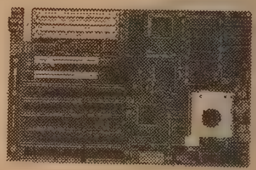

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Mitac 14.4K Internal Fax Modem	$129
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IDE

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270MB	LPS270A	128K	Fast	3.5x1	$235
540MB	LPS540AT	128K	Fast	3.5x1	$398

SCSI

Capacity	M/N	Cache	Speed	Size	Internal	External
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270MB	LPS270S	128K	12ms	3.5x1	$269	$375
540MB	LPS540S	512K	10ms	3.5x1	$489	$609
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1.2GB	PD1225S	512K	10ms	3.5	$935	$1049
1.8GB	PD1800S	512K	10ms	3.5	$1099	$1219

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270 MB IDE **$235**
128K Cache, 3.5X1"

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512K Cache, 10ms

Seagate

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Capacity	M/N	Cache	Speed	Sixe	Int.	Ext.
341MB	ST3390N	256K	12ms	3.5x1	$399	$529
456MB	ST3550N	256K	12ms	3.5x1	$529	$639
525MB	ST3600N	256K	10.5ms	3.5x1	$679	$799
1.05GB	ST11200N	256K	10.5ms	3.5	$799	$919
1.0GB	ST31200N	256K	9ms	3.5x1	$779	$889
1.4GB	ST41651N	256K	15ms	FH	$1099	$1299
1.9GB	ST42100N	256K	13ms	FH	$1489	$1689
2.1GB	ST42400N	256K	11ms	FH	$1699	$1899
2.1GB	ST12400N	256K	9ms	3.5	$1499	$1629
2.9GB	ST43400N	512K	10ms	FH	$2199	$2399
2.9GB	ST43401N	512K	Fast Wide SCSI II	5.25	$2499	$2699

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- Low Profile, Only 1"
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- 256K Cache
- 3600RPM

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- 2511A
- Includes 1 cartridge
- Formatting Software for MAC (Free upon request)

SCSI

Capacity	M/N	Cache	Speed	Size	Internal	External
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2.0GB	M2654SA	256K	12ms	FH	$1395	$1599

IDE

Capacity	M/N	Cache	Speed	Size	Price
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MICROPOLIS

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IDE

Capacity	Model	RPM	Speed	Size	Internal
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1.75GB	MC2217A	5400	10ms	3.5	$1199

SCSI

1.0GB	MC2210	5400	10ms	3.5	$749	$859
1.0GB	MC2210AV	Audio/Visual			$999	$1109
1.4GB	MC1908	5400	11ms	FH	$1249	$1449
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PENS AND PALMTOPS • BY MITSU HADEISHI

Whither Palmtops?

Since the fanfare surrounding the launch of the Apple Newton, the palmtop and PDA (personal digital assistant) industry is apparently entering a kind of doldrums period. New product announcements are slowing, and the introduction of new technology for existing products is also reaching a kind of plateau.

This could well be the result of lackluster demand for the Newton, which started off with strong sales that weren't sustained for very long. The industry seems to be entering a retrenchment period, in which technology and design are reengineered with an eye toward better performance, more functionality, and lower price.

Pens: Results Still Disappointing

Rumor has it that new PDAs are being designed with optional detachable keyboards (departing from the dogma that only pen-only computers could sell—as it turns out, the opposite seems to be the case). Pen-based computers still seem to primarily occupy a niche market, with more applications in point-of-sale and other vertical-market areas than in the larger general consumer market. I believe this has to do with the fundamental awkwardness of the pen input device; even if handwriting recognition were to operate perfectly, the simple fact is that writing stuff by hand is much slower than typing it in, even on the small keyboards available on palmtop computers.

I think it may not be until voice recognition becomes feasible on palmtop computers (something that will take some time) that non-keyboard interfaces will become practical for the wide majority of users. Although the pen interface might seem more "natural" to users unable or unwilling to use a keyboard, these computers have had difficulty penetrating the mass market.

Keyboard Units Thrive

Meanwhile, sales of the less expensive keyboard-based organizers continue to be strong and healthy. The Psion 3a, a keyboard-based palmtop reviewed recently in these pages, has enjoyed rising success in the market, as its ease-of-use, menu-driven graphical interface, and excellent overall design has made it popular with a wide range of consumers looking for a powerful and practical palmtop. Interest in the Psion 3a is evidenced by the strong showings in various computer network bulletin boards devoted to palmtops; it's the most popular palmtop organizer topic on CompuServe, for example.

The other strong market in palmtop-class machines continues to be the HP 100LX series and similar machines; these DOS-compatible palmtops are about the same price as the Apple Newton and compatibles, are capable of running DOS applications, and generally speaking have respectable organizer capabilities. Since these machines also tend to have PCMCIA slots, they are expandable using the vast and growing array of PCMCIA memory cards, fax modems, and other devices which I have covered at length in this and previous issues. Since the DOS-compatible sub-subnotebooks can also run DOS device drivers, they are also candidates for running network software, enabling you to be able to hook them to networks using PCMCIA Ethernet cards and the like.

> It may not be until voice recognition becomes feasible on palmtop computers that non-keyboard interfaces will become practical for the wide majority of users.

This market is quite mature at this point, with a large installed base and ample software support. The disadvantage of these types of machines is, as always, that DOS was not specifically designed with palmtop computing in mind, and this makes the interface sometimes less than ideal for a very, very small computer (and very small screen and keyboard). Nevertheless the flexibility and compatibility of these machines are a great advantage to a large number of consumers.

It may be some time before a new wave of palmtop designs hits the market; until then, we will spend our time discussing existing organizers, palmtops, and pen-based systems as they evolve and as accessories and other enhancements emerge for them.

Convention Announcement

The Personal Communications Industry Association (PCIA) is holding their 46th annual convention on September 21–24 at the Washington State Convention Center. The conference is intended to cover a wide range of areas, including paging, cellular, wireless data, satellite communications, personal information devices, pen-based computers, and voice messaging, among others. For information call Robert Mesirow at (202)467-4770.

continued on page 53

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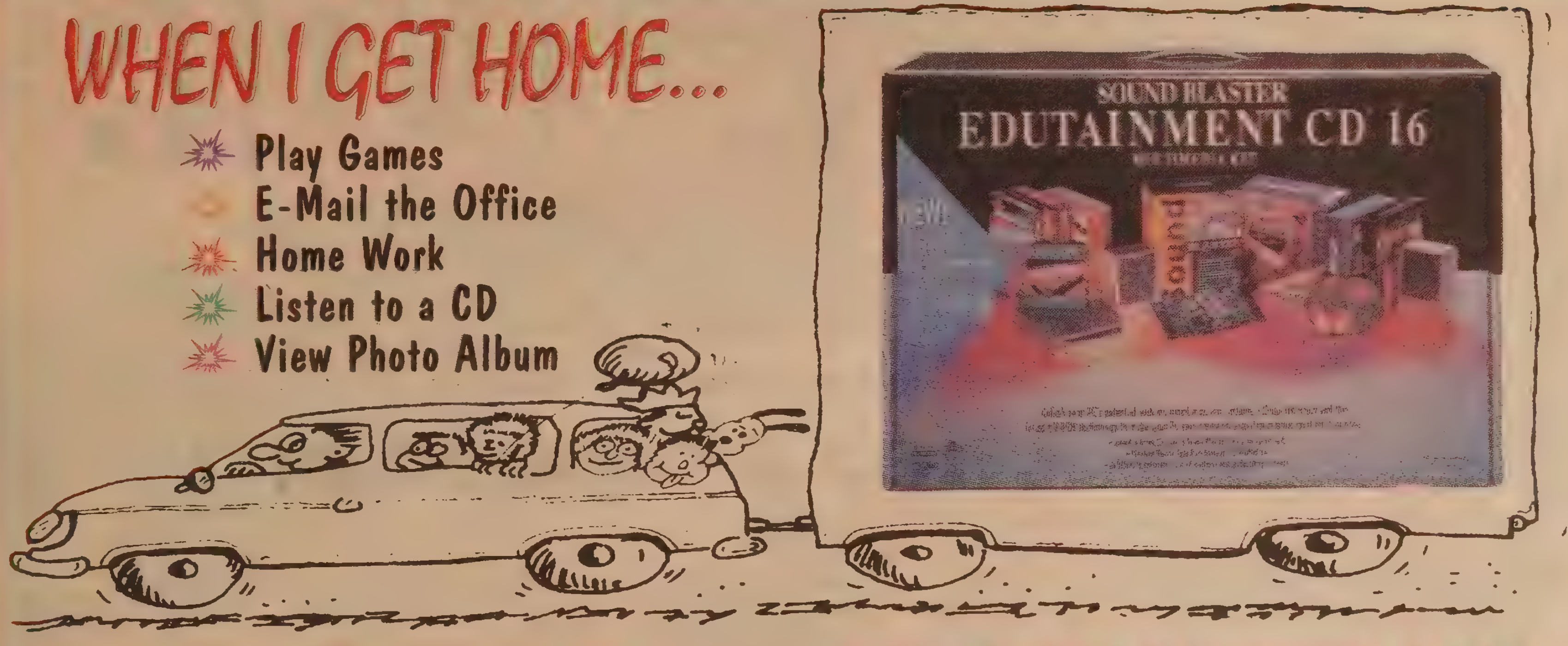

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Wireless News

•Dauphin Technology, manufacturer of the DTR-1 pen-based and keyboard-based convertible notebook computer, has announced the DTR-1/WAN, an enhancement to the DTR-1 that includes a RAM Mobile Data Wide Area Network (WAN) radio with an extended battery pack. The RAM Mobile Data network is a two-way data packet-switching network, with coverage in over six thousand cities, covering 90% of the urban business population. The DTR-1/WAN is capable of sending data over the RAM Mobile Data network at a rate of 8000bps, using 512-byte packets. Pricing was not available.

> The palmtop market is quite mature at this point, with a large installed base and ample software support. The disadvantage of these types of machines is, as always, that DOS was not specifically designed with palmtop computing in mind.

•MagicCAP is a special scripting language and user interface for personal wireless communicators developed by General Magic, an Apple spinoff company. The user interface metaphor is that of a small town, with buildings you can enter which have hallways and rooms inside. The Motorola Envoy is a wireless handheld communicator which uses the MagicCAP system to provide wireless information services. Among these services, America Online has recently announced that it will be available using the Envoy and MagicCAP, via an America Online building in the simulated "downtown" area. Email, news, business, sports, stock quotes, and portfolio information will be available via the America Online service using the Envoy. In addition to the usual features, online support will be available for the Envoy and MagicCAP platform via email, the General Magic online area, and a newly created Motorola online area.

•Traveling Software, Inc. and National Semiconductor Corporation have jointly

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produced a combination of hardware and software called LapLink Wireless with AirShare which will synchronize files between a portable computer and a desktop PC using a wireless connection. For example, you might edit some files on your organizer, palmtop, or laptop computer out in the field, and when you get back the unit will automatically detect the changes and synchronize the files in a manner pre-specified by the user. No need to hook up cables or even activate the software; just by having both machines turned on and walking close by your desktop computer, LapLink Wireless will detect the connection and automatically synchronize your files.

Newton News

The Apple Newton news front has been relatively quiet recently. State of the Art, Inc., however, is shipping ExpensePlus, business expense reporting software for the Newton MessagePad technology. ExpensePlus allows you to quickly and easily track expenses by clicking on one of twelve predefined spending category icons. For example, to record a dinner expense, click on the "dinner" icon and write in the expense. The program can prepare summaries and expense reports, and print, beam, or fax them for review. The suggested retail price is $139.95 on disk and $159.95 on a PCMCIA card.

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Motorola Envoy
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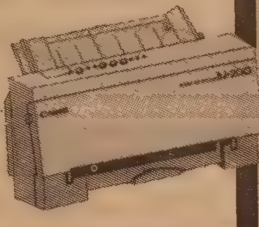

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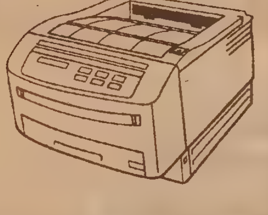

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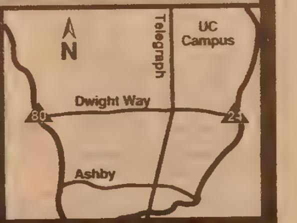

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More PCMCIA Devices

•A number of palmtop computers, including the popular HP-100LX, have only one PCMCIA slot; in this case, if you want to have both RAM and a fax/modem card at the same time, you're out of luck. This is particularly important in a machine like the 100LX, since by itself the machine doesn't have enough RAM to receive a fax; you need an expansion card. However, if the expansion card is present, you cannot use an internal fax modem; you have to use an external fax modem, which can be bulky and requires carrying around an extra piece of hardware.

SMART Modular Technologies has created the Fax/Memory Combo Card which combines a 2MB (or 4MB) Flash RAM card with a 2400bps data/9600bps fax modem in one Type II PCMCIA card, obviating the need for an external fax modem; you can carry all the functionality you need in a single device. The card draws a current of 2mA when in "sleep" mode. The card retails for $349 in the 2MB version, and $449 in the 4MB version.

•Protege Corporation has created a low-cost, high-performance device intended to allow PCMCIA-ATA flash disk or rotating hard disks to be accessed from any 16-bit ISA DOS computer. Retailing at $99.95 for an internal unit which fits in a 3.5" floppy drive bay, the device is cheaper than alternative technologies I've seen so far; and it is also different in that it comes with its own interface card which allows high-speed access. Some other similar units use the parallel port as an interface (which means they are limited to slow parallel port data transfer rates), and are often more expensive as well.

The ATA/X, as it is called, supports both PCMCIA-ATA Type II Flash Cards (as I understand it, not all flash RAM cards are ATA-compliant, so be careful), and Type III 1.8" hard disks, including some cards from SunDisk, Epson, and Western Digital. The unit enables "hot" insertion and removal of cards, which means you can insert and remove the cards without turning off the computer first. An external version is available for $179.95.

•IBM has announced a line of high-capacity solid state mass storage cards, ranging from 3 to 20MB in PCMCIA Type I form factor (the thinnest) and from 30 to 40MB in a Type II form factor. No firm price was announced on the cards, but IBM says the higher-capacity cards will be available to OEMs for less than $25/megabyte, which puts the 40MB card in the under-$800 price range for OEMs.

•Megahertz Corporation is releasing an aggressively priced $259 PCMCIA Ethernet adapter, considerably cheaper than other PCMCIA Ethernet adapters I have mentioned in previous columns. The adapter supports Novell NetWare, Microsoft LAN Manager, IBM LAN Server, Banyan Vines, and other protocols. Both a 10BaseT and a 10Base2 version is available.

•For portable computer users who might need to connect their computer to different networks during the course of their travel, a dual-connector (10BaseT and 10Base2) PCMCIA Ethernet card could be quite useful. Socket Communications, Inc. has produced a $369 high-performance PCMCIA Ethernet adapter, the EA+, which supports both 10BaseT and 10Base2 connectivity in a single card. The EA+ also supports the Microsoft Plug-and-Play BIOS, which will be provided by Chicago, for those portable computers that can run Chicago (a.k.a. Windows 4.0) in the future. The EA+ also has an NE2000 emulator, which allows it to be easily used by almost every known network operating system. ■

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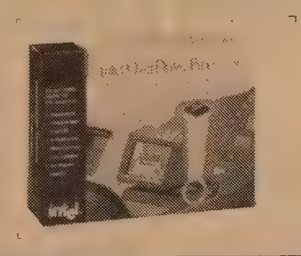

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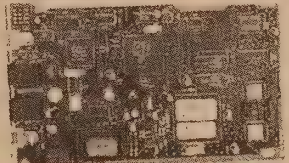

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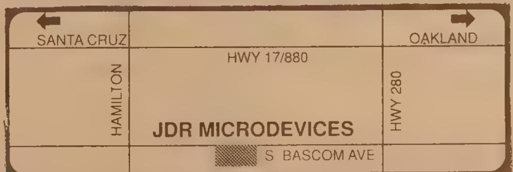

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What To Look For In A Laptop PC

Considerations For DOS And Windows Users

This month I've had four calls from friends asking which laptop is the best. My answer is always the same, so I thought I should publish my advice and then just hand it out whenever the question comes around again.

In fact, all of the machines are good. The technology has advanced to the point that virtually any laptop or portable you choose will do the job. Only you can decide which configuration suits your needs best, but there are a number of criteria that will apply to any configuration you choose.

Basics

First, you'll need to decide whether you want a laptop, notebook, or sub-notebook machine. The larger the unit, the larger the display and keyboard. The smaller the computer, the more portable it will be.

The next consideration is whether you want color or monochrome. Color costs a little more, but the display is easier to work with. These days, there are two basic color technologies available. The best, and most expensive, is active matrix color, definitely the top of the line. In the past, the alternative was passive matrix, which was decidedly inferior. When those were the only choices, I would have chosen either active-matrix color or a monochrome screen.

Now, however, there's a third alternative: dual scan passive matrix. For most purposes, I rate this nearly as high as active matrix, and it is a lot less expensive. This is probably the right choice, if you've decided that you want a color display. In some cases, dual scan is only a couple of hundred dollars more expensive than monochrome.

But before you make a final decision in the color vs. monochrome dilemma, bear in mind that color systems will not run as long on batteries as monochrome units. If the length of time a charge lasts is a major consideration, stick with monochrome or be prepared to carry extra battery packs along.

There's also another side to the question. If you use your portable primarily at a fixed location where you can attach a color monitor, there may be little reason to spend the extra money for a color LCD, as you will use it only infrequently. So coupled with the longer battery life, this fact may make monochrome the most attractive option. You must weigh these alternatives.

The next decision you have to make is how much memory you'll want. These days, four megabytes of RAM are nearly standard, as Windows simply doesn't do well with less RAM. You may want more memory, which all of the decent portables are designed to allow. If you don't work in Windows, four megabytes is more than you need, but the extra memory won't hurt anything and you'll be set up to make the transition to Windows if you decide to do so later.

You will also have to decide what speed processor you want. I recommend nothing slower than 25MHz, and really would prefer to operate at 33MHz or faster. Again, if you're operating in standard DOS, a slower speed is perfectly acceptable, but if you will be using Windows at the outset or soon, you will be disappointed in the performance if you get a slow machine.

Hard drive size is the final choice you will have to make. If you run scads of applications, you will want a larger hard drive. On the other hand, if you run only one or two applications in Windows, a hard drive with a capacity of, say, 100MB should be adequate. If you will not be using Windows, a smaller hard drive is certainly adequate. With DOS 6.2 or later, you can double the capacity of the hard drive should you find you need more space. My recommendation is that you buy a hard drive that has enough room to suit your needs and not use the disk doubling feature of DOS until you find you can't do without it.

More Issues

With the basics out of the way, here are some pointers that you should follow, no matter what configuration you have chosen. Following these guidelines will help make your portable what you dreamed it could be and not the nightmare that some of them turn out to be.

Two features are indispensable. First, no matter how good the built-in keyboard is—and you should make sure you like the layout and feel of the computer you're considering—you should have the option of installing a standard full-size PS/2 compatible keyboard. This means that you can use a keyboard of your choice with your computer when you're not on the go. Keyboards are not expensive, and it is a shame to be tied to an inferior built-in keyboard in order to accommodate portability when you are in your office or at home.

Keyboards are so personal that there is no universal answer to what is the best layout or feel. Only you will know what works best for you. The best keyboard layouts on portables have separate keys for cursor movement. Some of the poorly designed layouts require you to press a function key in addition to another key in order to access home, end, page up, and page down. This is too awkward for serious word processing.

My second requirement concerns displays. Make sure that you can attach a VGA

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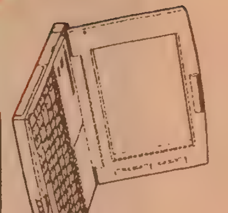

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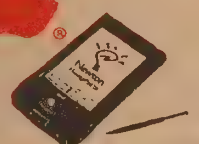

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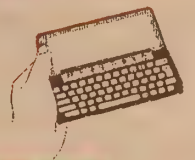

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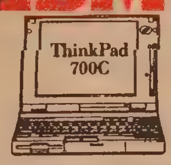

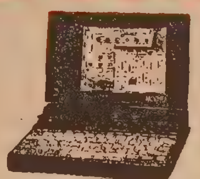

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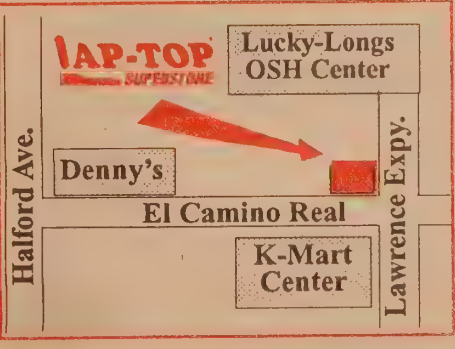

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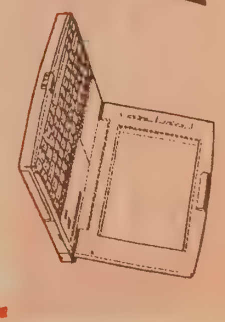

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or better color monitor. Most machines allow this, but there are still several things to check out before you buy. I always prefer a unit that lets you easily switch back and forth between the built-in display and the external monitor. Some of the machines accomplish this so easily that you merely plug in the monitor and it works as the primary display. On other models, you have to make alterations within a setup program.

Some portables will allow you to choose to see the display through either the built-in display, an external monitor, or both. I connect a great monitor and keyboard, and then the computer itself serves pretty much as a black box. I turn on the machine and after that have little to do with it until I finish my work for the day.

Remember that the two interfaces you have with a computer are what you see and what you feel. By having a choice over these two components, you can customize your interface.

Another thing I like to check out is whether it is possible to close the cover of the machine when it is running. I like to do this when I am using the external monitor and keyboard. Some computers will beep incessantly if you close the cover. Others will automatically enter into a sleep mode, which effectively means you can't close the cover and use the computer. All other things being equal, I prefer models that are designed to let you do this. This is something you will normally not discover until you have laid out your cash and taken the machine home. Careful shopping may help you avoid pitfalls.

Horror Story Avoidance For The Long Term

A final, and perhaps the most important, feature to check out is the after-warranty service policy. It is certainly important to know the details of the warranty: just what is covered and for how long—do you pay freight charges or do they come to your home, and the like. But few buyers check out what happens to your machine after the warranty period is over.

Not long ago, I had a computer with a relatively minor problem. The manufacturer asked if the machine was in warranty. When they heard the covered period had ended, they said that a diagnosis would cost $75 and that probably it would be necessary to change the motherboard. That cost nearly $800. There was no provision for a simple repair.

What you have to remember is that with a desktop machine, service is not really a problem, as you can swap out components and substitute parts made by another vendor. In this way, you can keep upgrading your computer.

But in the case of portables, parts are generally not generic. That means if a switch breaks, you must get it from the manufacturer. If your battery pack wears out, you will be required to go back to the people who made the machine. If a latch breaks, there is only one place to have it fixed.

So before you buy, be sure that you are not simply buying the least expensive machine. It is important to know that the manufacturer of your machine will be in business several years down the road and that they will still be willing to service your computer for a reasonable charge. Some vendors will do anything to sell a new machine, but don't have much interest in maintaining machines already in the field. Many users have had to literally throw away portables with relatively minor problems because they simply cannot get them serviced reasonably.

All of these criteria can often be met by machines that come from manufacturers who sell directly to the public. Several of these firms are actually my first choice when it comes to recommending a portable. They have prospered by giving excellent service in and out of warranty and have set things up so you can often get better follow-up advice than you can for computers purchased through retail chains. Before you buy any machine, I would recommend that you find the phone number that you will call for service. If you have trouble getting through before you buy, you can be sure that you will have trouble after you have given them your money.

I recently waited over a week to get in touch with a manufacturer through the 800 number they listed in their literature. Nobody knew who was really in charge of service for the model I had and nobody seemed to care. To make matters worse, Microsoft would not deal with me, as they said the manufacturer had a proprietary version of both Windows and DOS and that therefore I would have to deal directly with them.

Careful attention to the points I have raised in this article should save you from lots of headaches down the road. Portables are becoming an increasingly important segment of the computer market, but buyers need to be educated in the pitfalls that may appear.

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BY ROBERT MOSKOWITZ

Los Angeles' Metro Transportation Authority's "Blue Line Televillage"

Combining Its New Fiber Optic And Light Rail Systems, The Blue Line Televillage Offers To Help Revitalize Los Angeles

What if you had a three-hundred-mile high-capacity fiber-optic backbone system available to you, and it had plenty of excess capacity? What if it ran through all corners of a region desperate for new sources of information, access, and telematic mobility?

Chances are you'd try to put it to good use. And that's just the concept behind Los Angeles County's Metropolitan Transportation Authority's "Blue Line Televillage," an undertaking that some experts are labeling "the single most innovative application of telecommuting and telecommunications in the world today!"

Actually, the Blue Line Televillage is only the first demonstration (as far as I can determine, anywhere in the world) of a concept contained in a policy report entitled "Metro Net—Fiber Optics and Metro Rail: Strategies for Development." The report lays out a comprehensive analysis and justification for just the kind of projects of which the Televillage is a small example. The author of the Metro Net report is Walter Siembab, a prominent telecommunications strategist and consultant who has previously been mentioned in this space as the director of Telecommunications for Clean Air, and the Telework Facilities Exchange project. (I'll cover the Metro Net concept in detail in a future article.)

The Blue Line happens to be a perfect facility for this demonstration project. It is a modern, light rail system that runs from the downtown area of Los Angeles to Long Beach, some twenty miles away. The fiber optic system was initially installed to provide a channel for video security camera signals and other railroad control functions. But these demands leave plenty of unused capacity on the cable—capacity that can be made available for other purposes, essentially for free.

The Blue Line Televillage project will attempt to make good use of this valuable but heretofore inaccessible resource. Budgeted at $559,000, but charged with encouraging in-kind grants and contributions from participating organizations and institutions, the Televillage demonstration may bring more than a million dollars in seed and development money to a neighborhood with a long history of woefully scarce resources.

Over a period of twenty months, the Televillage project will provide no-fee and low-fee opportunities for residents along the Blue Line to make use of existing and yet-to-be-installed facilities such as workstations, meeting rooms, and a variety of automated devices.

The project's broad sweep of demonstration and development goals includes efforts to establish totally new community services by linking existing institutions with constituents or consumers who are now too isolated to benefit from the services and resources the institutions have to offer. This would include—but not be limited to—trade, technical, and other levels of education; direct access to City, County, and State information and services; and medical counseling, self-help awareness, and outpatient treatment.

A large part of the anticipated benefit from the Televillage project will be generated by the individual and collective fallout that results from introducing many previously disadvantaged adults and children to the advanced computer, video, and information technologies generally associated with telework and telecommunications.

Many economists suggest that providing new and enhanced services at, or adjacent to, Blue Line rail stations would increase the development value of surrounding properties. Some suggest the Televillage project could become both the information backbone for decentralized organizations and the physical backbone for a new wave of urban renewal.

At first glance, installing telework facilities along its right-of-way would seem counterproductive to the MTA's mandated drive to increase ridership. But preliminary studies seem to indicate that providing information and telework services along the right-of-way would also stimulate rail travel. By attracting people and in turn development to Blue Line stations, the Televillage project is likely to stimulate new activities that would be highly conducive to increased rail travel. What's more, the Televillage services and activities are likely to generate excess revenue that can be used to help defray the cost of running the railroad, which in turn might allow fares to be reduced enough to attract additional commuters from cars to the light rail system.

The first stages of the Televillage project are intentionally designed to enlist community support and input to help determine exactly what services will be implemented first, and the methods and pricing patterns by which they will be offered. Thus, no clear plan yet exists for providing specific services. However, informed speculation suggests that some of the most exciting and important uses of the Televillage concept will likely be as follows:

> Some suggest the Televillage project could become both the information backbone for decentralized organizations and the physical backbone for a new wave of urban renewal.

Teleservices

In a depressed community literally starving for lack of public and private infrastructure, some of the most important

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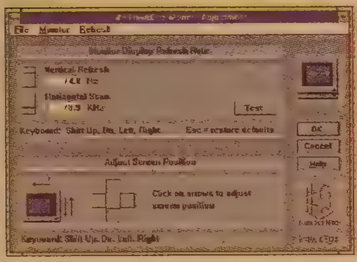

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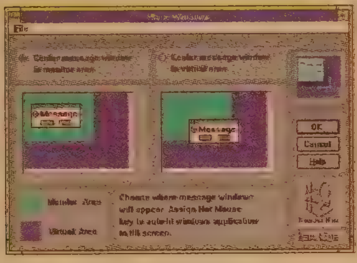
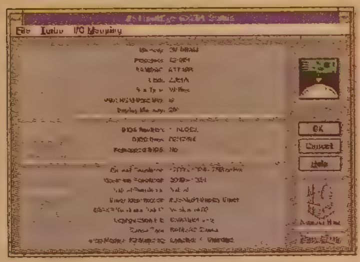
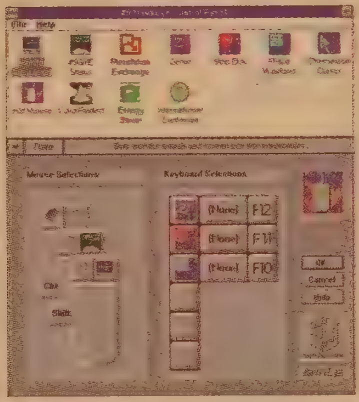


Place Windows: Quickly position dialog boxes to screen center or fit applications to full screen when in virtual desktop mode.



Instant Status: Hardware and software configuration data is immediately available to quickly pinpoint system state-of-health.



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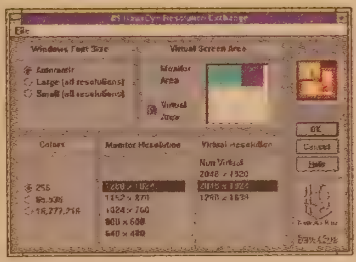
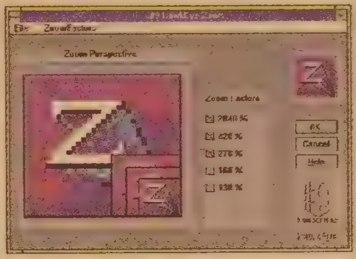
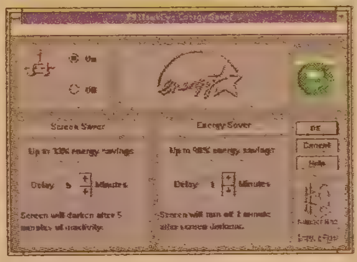


Resolution Exchange: An all-in-one resolution control center to easily select color depth, screen resolution and virtual desktop size.



Hardware Zoom: For close-up views, instantly magnify your screen up to five times normal size. Panning brings every pixel into view.



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applications for fiber optic capabilities will be to support a wide range of transaction machines. These could certainly include automatic teller machines from banks that do not now have offices in the Televillage project area. One can also expect to see government-operated information kiosks providing answers to questions, registration capabilities, and new channels for two-way dialog with elected representatives and their staffs.

There is plenty of precedent for this. For example, the state of California has successfully administered intake interviews to applicants in its Aid to Families with Dependent Children program. The state government also established fifteen kiosks in remote locations which provided access to information and services from eighteen different state government agencies. Los Angeles County installed a 24-hour "AutoClerk" kiosk at the Long Beach County Courthouse, allowing drivers to go there to pay the fines on a variety of parking and moving violations.

Other government services could similarly be offered through automated kiosks or through decentralized, professionally staffed offices. These offices could be far smaller and less expensive to operate than their central-city equivalents because they could be supported by information services delivered over the Blue Line fiber network. Later, commercial organizations might want to operate facilities near these established sites.

> By attracting people and in turn development to Blue Line stations, the Televillage project is likely to stimulate new activities that would be highly conducive to increased rail travel.

One plan is for Blue Line stations or nearby facilities to be "built out" with two types of rooms: One type would be "open plan" rooms suitable for meetings, video conferences, and classroom-style distance-learning experiences. A second type of room would contain many smaller, modular, flexible spaces that could be fitted out for use as telework stations or more individualized activities and study. Residents desiring to take a class or access a provided service would need only walk or drive to the nearest Blue Line station, and if necessary could then take a train to the nearest suitable site.

Other facilities could be constructed near Blue Line stations to support outpatient medical services, counseling, and instruction. Kaiser Permanente, which has a great many subscribers in areas close to the Blue Line route, could establish clinics at favorable sites and staff them during peak-demand hours. Medical personnel at the sites could be supported over the fiber-optic network by medical records and more specialized staff located in a different part of the city. It is unlikely that such services could be offered cost-effectively without the Televillage concept or use of the Blue Line's network resources.

The same meeting rooms, clinic resources, and workstation facilities could be used at different times by a wide variety of organizations.

Telework Sites

With jobs hard to come by in areas along much of the Blue Line route, one attractive possibility of the Televillage project is to support telework facilities where community residents can perform useful work for companies located outside their neighbor-

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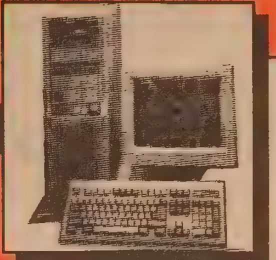

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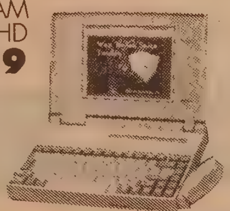

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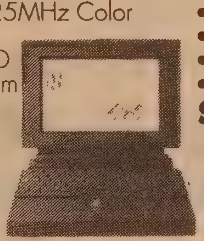

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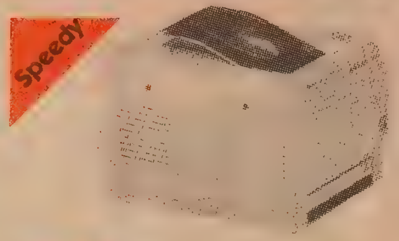

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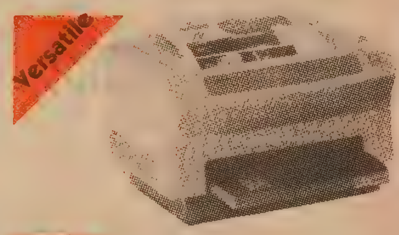

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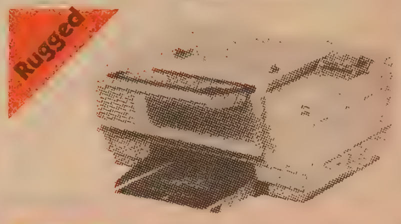

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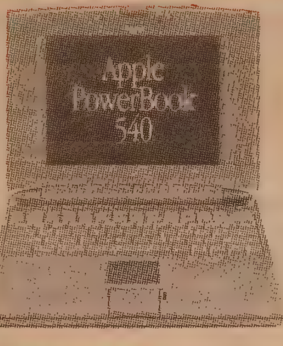

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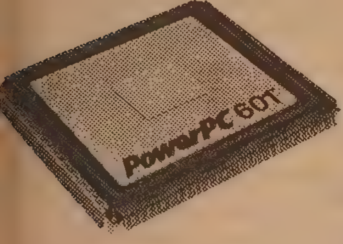

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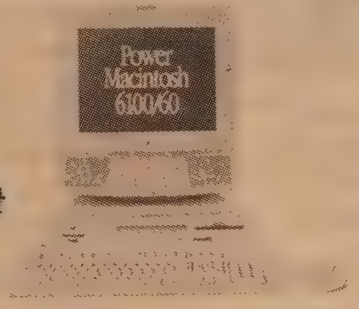

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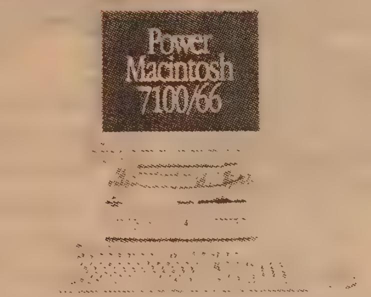

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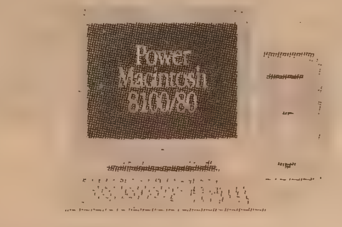

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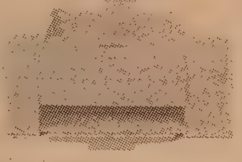

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hoods, and where other residents with fewer skills can learn and upgrade their capacity to earn a living wage.

For example, organizations offering medical services or distance-learning opportunities could hire local residents to do some or all of their keypunching, billing, and other telework-appropriate tasks. Fully trained and able to work very close to their homes, these employees would likely prove at least as reliable as other employees, who of necessity must commute fairly long distances to reach their place of work.

Educational centers such as UCLA Extension or local technical schools are likely to offer "distance-learning" courses fed from their campuses directly to meeting rooms along the Blue Line right-of-way. Because of the fiber-optic backbone's capabilities, these classes could be lecture oriented, or could be organized around lively interactive discussions.

Teleconferencing Capabilities

By providing suitable meeting rooms at sites along the Blue Line right-of-way, the Televillage project will be able to support a variety of teleconferencing formats. This would enable community groups to meet with each other, and with organizations based outside the community more often and more readily. Offering telecommunications support for community meetings would help facilitate residents' pooling their ideas and information, making plans, formulating programs, and carrying out action agendas of almost any nature.

Meetings could include classroom-teacher interactions, political discussion-organizing convocations, and/or citizen-parent conversations in support of schools and other local institutions.

The Televillage proposal would be operated in connection with the Drew Economic Development Corporation, which for twelve years has been an integral part of South Central Los Angeles' community, and which has a successful track record of developing affordable housing, child care centers, business training programs, and industrial investment.

According to the plan, the specific mix of public, private, and subsidized services to be implemented at each station will be determined through community input, and by research into community requirements and demographics. The study will consider each potential site in terms of such important factors as:

a) the local population density and characteristics;

b) the local population's need for health care, jobs, education, and other services;

c) the present level of job skills and employment among residents near the site;

d) the potential for those presently employed to be telecommuting once the site is opened; and

e) how access to specific services at the proposed site would impact the local residents' pattern of economic, lifestyle, and transportation choices.

Derailed Before Leaving The Station?

Unfortunately, as of late April the project remains on hold because of funding prob-

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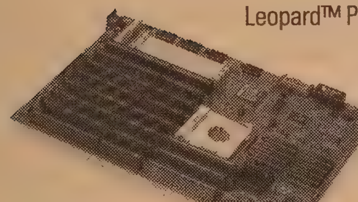

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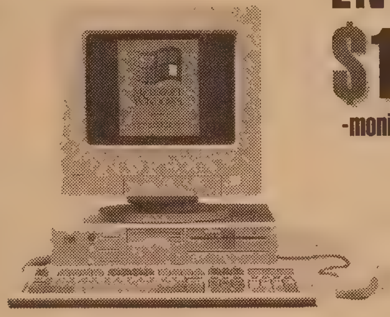

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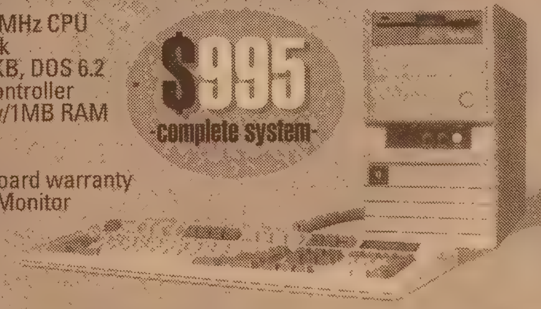

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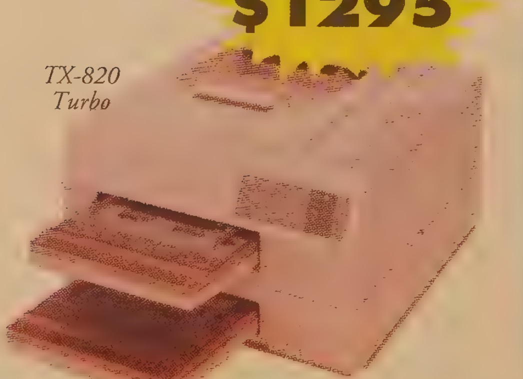
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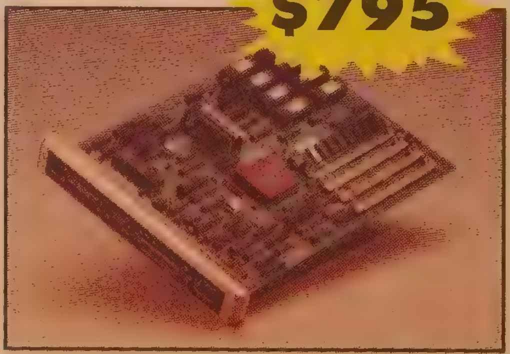

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lems at the MTA. In fact, the Televillage Project Coordinator's position might be entirely eliminated as a cost-saving measure. If that happens, the entire Televillage project stands a good chance of becoming "de-obligated," which is a bureaucratic euphemism for returning the money to the general expense pool where it would pay for light bulbs and paint jobs instead.

There is talk among insiders of a tentative plan to shift the burden of Televillage staff costs to CalTrans, which wants the project to go forward. But CalTrans itself is on a tight budget. Another source of difficulty in getting CalTrans committed to the project is that decision-makers there are having trouble determining whether to administrate the Televillage from Los Angeles or Sacramento. This sounds to outsiders like a turf dispute, but without direct knowledge I'm reluctant to call it one.

Information on the status of the Televillage project has been particularly hard to come by. None of the MTA's public information staff even knew what it was when I first made inquiries. Only a single staffer, Dan Wright, seems knowledgeable about the program, but his position is the one that's under the Sword of Damocles.

Franklin White, who runs the MTA, specifically refused to be interviewed for this article, and Judy Wilson, a knowledgeable member of his staff, reneged on a promise to call me. From this and other evidence, it's clear there is now no sign within the MTA of a strong commitment to this project.

Personally, it seems inconceivable to me that the MTA is willing to allow a relatively minuscule item in its multi-billion-dollar budget to be the stumbling block that denies the people of South Central Los Angeles what seems to be a totally new and exciting opportunity to gain access to government services and to improve themselves economically. Are we going to see a replay of the old story: For want of a nail, the war was lost?

I'll keep you posted on further developments regarding the Blue Line Televillage as they occur (or fail to occur). In the meantime, you might want to inquire about the status of the Blue Line Televillage project directly from Franklin White. His telephone number is (213)244-6568. ■

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Resource Discovery And Access

It's Out There Somewhere, But How To Find It?

In the early days of the commercialization of the Internet (at least two years ago) new users used to complain about the lack of available services. Beyond electronic mail and USENET news there was ftp and telnet; those last two protocols were perceived as hard to use because they were command-line oriented.

There was also the perception that access to even these services required a UNIX system, and they were therefore inaccessible to all but the very sophisticated technical user. There is some truth to this statement. However, software to access even the basic Internet services has been available for at least five years on both Mac and PC. The biggest problem with the basic Internet services such as telnet and ftp is they don't provide any kind of roadmap of what resources are available on the Internet.

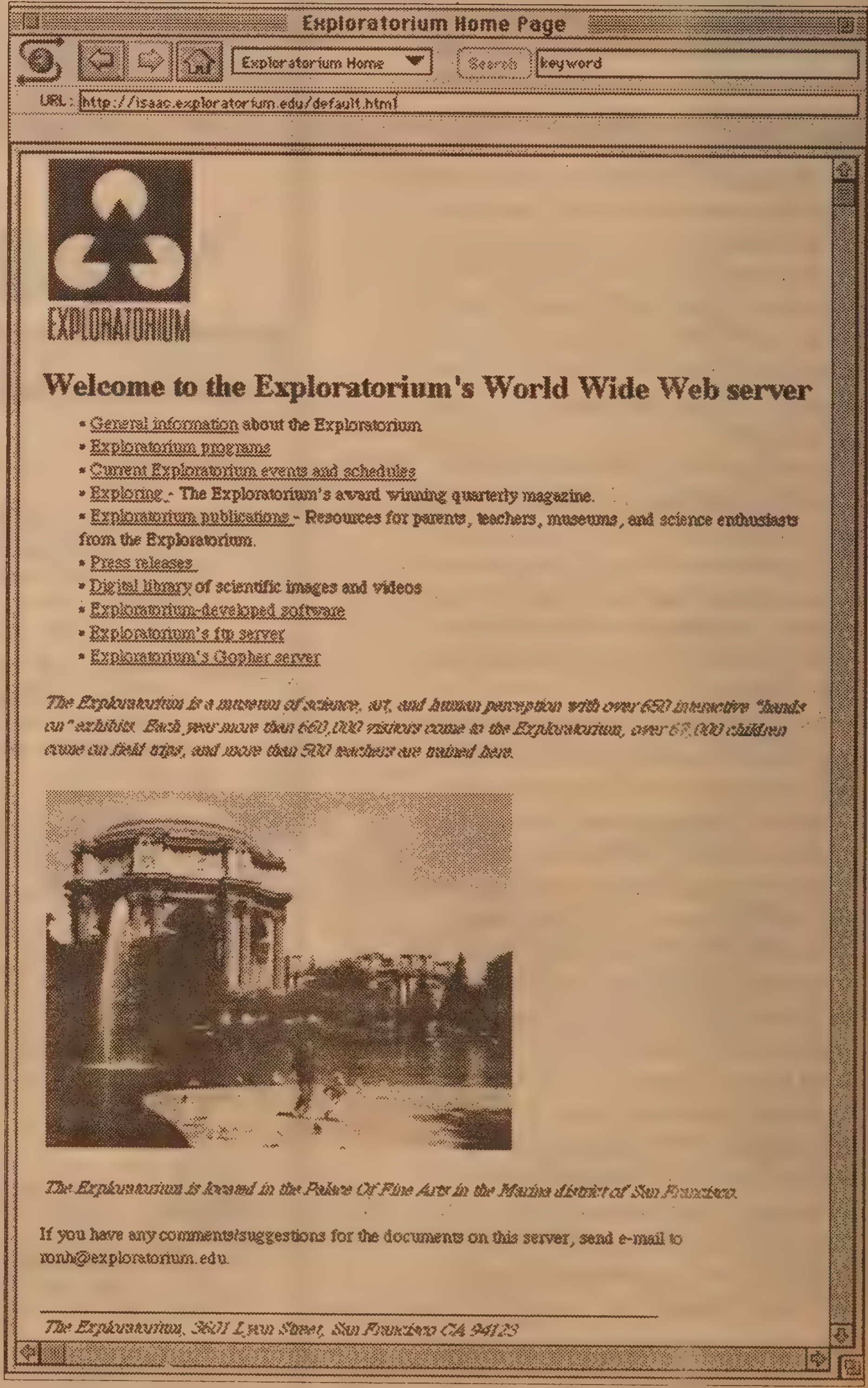
Evolving Search Tools

Telnet lets you remotely access any host on the Internet that you have a login account on; ftp lets you transfer files from any remote host. A clever extension of ftp, called anonymous ftp, lets you access large archives of publicly available information without requiring a login account on the remote host.

But how do you know which host to telnet to, to access, say, the Library of Congress card catalog? And which anonymous ftp site has that nifty Mac game software?

In the old days, people tended to find this information via word of mouth. As offerings on the Internet grew, the word-of-mouth approach rapidly became inadequate; users increasingly complained

It is now possible to run Mosaic on a Mac or PC at home with connections to an Internet provider over a dialup phone link. While the limited bandwidth of even high-speed modems means the application does not retrieve information as fast, Mosaic is still usable.



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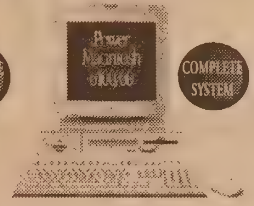

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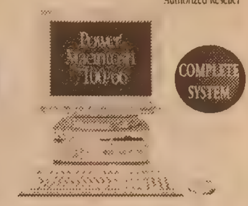

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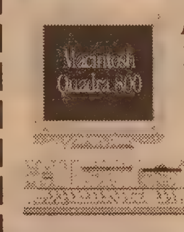

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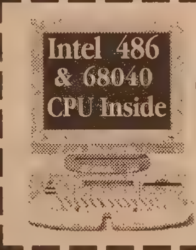

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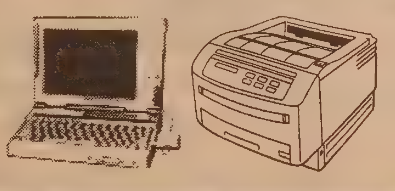

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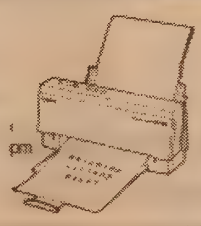

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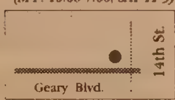

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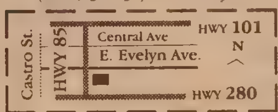

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about being unable to locate valuable and needed resources.

In response to these complaints, a whole flock of resource discovery services were developed. The first, archie, was originally a simple way of searching anonymous ftp sites. Archie clients suffered from the same command-line interface as ftp, but the program did get the job done in a relatively rudimentary way. More importantly, though, archie helped spawn some other resource discovery protocols.

The next to come along and become popular was Gopher, sometimes called "duct tape" for the Internet. It incorporated two important features: first, it moved away from a command-line interface and presented users with a set of menus from which they could select items of interest. More importantly, one Gopher site could add links to information at another Gopher site. These links let a user navigate from one site to another site transparently.

Gopher also incorporated much of the functionality of anonymous ftp as a part of its design. You can retrieve files with Gopher just like you can with ftp, since many anonymous ftp servers also support Gopher access to their archives.

An adjunct to Gopher is Veronica, which is sort of an archie for Gopher. Veronica lets you search the entire Gopherspace system by keyword. Several sites have set up Veronica servers; a Veronica server periodically scans all the Gopher sites and indexes each Gopher entry.

Another resource discovery service is also WAIS (Wide Area Information Server). WAIS is a distributed document indexing and retrieval system. It lets you access sets of documents distributed around the Internet by keywords. WAIS uses a sophisticated search strategy which checks the proximity of keywords in a document and returns the documents to a user, prioritized according to how well the document meets the user's search criteria. WAIS, like Gopher, has a system to link various WAIS servers around the Internet. A WAIS search can search documents on many servers at the same time.

Finally, we have the World Wide Web. The World Wide Web (WWW) is a hypertext-based information system. WWW is similar to Gopher, but is not limited to being just a set of hierarchical menus. Pointers to other documents can be embedded as part of a document, which is the whole point of hypertext in the first place.

So in the new world of resource discovery and information retrieval we have archie, WAIS, Gopher, Veronica, and WWW—and don't forget all those plain ftp archives out there on the Internet, or separate information systems available via telnet. All these systems are a little bit different because they serve somewhat different audiences.

Do you have to switch user interfaces to use all these systems? Yes and no. You can get user interfaces for Gopher and WAIS that only work with those services. Typically Veronica is accessible from all

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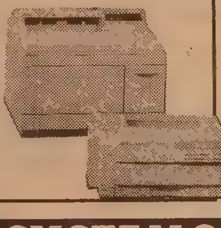

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Gopher interfaces; many Gopher clients let you use telnet and let you transfer files with much the same functionality as ftp.

Switching user interfaces can be confusing to many Internet beginners—all the interfaces don't have the same "look and feel."

Mosaic

Fortunately, the Mosaic document viewer supports all these services. Mosaic was developed by the National Center for Supercomputing Applications as a document browser for WWW. Recently, a company has been formed to provide commercial support for Mosaic.

Mosaic has been called in some circles the "killer app" for the Internet. It gets this reputation mostly by being the jack-of-all-trades document viewer. Mosaic has a friendly graphical user interface. A beginning user can very easily run Mosaic and browse through documents at many Internet archive sites.

It supports access to WWW servers and Gopher servers. It also lets you do WAIS and Veronica searches. In addition, you can gain access to information sources only available via telnet. For example, the Vienna Stock Exchange is available using telnet from within the Mosaic browser, allowing you to look at stock prices on the exchange. For the casual Internet browser, there is little need to stray outside the Mosaic environment once inside it.

Mosaic was originally developed as an X-Windows application and ran principally on UNIX workstations. The program has since been converted to both the Macintosh and IBM compatible PCs running Windows. This opens up the product to a much wider audience. It is now possible to run Mosaic on a Mac or PC at home with connections to an Internet provider over a dialup phone link. While the limited bandwidth of even high-speed modems means the application does not retrieve information as fast, Mosaic is still usable. ISDN service, which promises speeds up to 128 kilobits per second (well above the effective 14.4kbps available with a high-speed modem) is a perfect fit for Mosaic, and for the individual or small-business Internet user who cannot afford dedicated access.

Performance Systems International, an Internet provider, recently announced support for ISDN in some areas and also announced support for a service with Mosaic as the focus of its service offering. Expect other Internet providers to follow with similar packaged services using Mosaic.

Mosaic is an exciting development and is spurring the growth of WWW servers, as well as other information resources. It is also introducing the Internet in a more friendly way to many nontechnical people. ■

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4E	$309
15" SVGA	$315

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Focus 7000+ w/ Trackball	$48
Fujitsu 4700/4850	$45/32
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Maxi 101	$22
BTC 5339R	$17
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Diamond Viper 2MB	$365
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4x3 70NS	$150
4x9 70NS	$159
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WS 4F/2H/ 2 Hi Speed S/P/ 2.88	$65
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Trantor SCSI Cont.	$39
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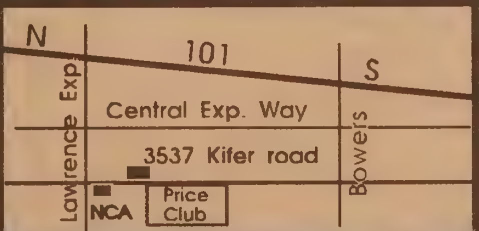

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- Auto Power Saving
- AMI Flash BIOS 256K Cache
- 16 MB 72 Pin RAM 70ns
- Teac 1.2MB Floppy Drive
- Teac 1.44 MB Floppy Drive
- Adaptec 2940 PCI SCSI-2 Card
- 540MB SCSI HD
- Focus 2001 101-key Keyboard
- Diamond Stealth PCI w/1MB
- Sigma Design 15" dark case
- Medium Tower Case
- 250-Watt Power Supply

$3299

PENTIUM PCI

- Intel Pentium 60 CPU w/fan
- 3 PCI Slots
- PCI IDE Controller Card
- 256K Cache
- 8MB RAM 70ns
- Teac 1.44 MB Floppy Drive
- 340MB IDE HD
- Focus 2001 101-key Keyboard
- Diamond Stealth 32 PCI w/1MB
- Sigma Design 15" dark case
- Medium Tower Case
- 250-Watt Power Supply

$2149

486-66 VLB

- AIR 3 VLB W/Power Saving
- AMD 80486DX2-66 CPU w/fan
- AMI BIOS 256K Cache
- 4MB RAM 70ns
- Teac 1.44 MB Floppy Drive
- VLB IDE/IO
- 340MB IDE HD
- Mitsumi 101-key Keyboard
- 32 bit VLB VIDEO w/1MB
- 15" 72 HZ Non-Int. Monitor
- Mini Tower Case
- 230-Watt Power Supply

$1249

486DX-40/128K

- ECS 3VLB Main Board W/ZIF
- Pentium Over Drive Ready
- AMD 80486DX-40 CPU
- AMI BIOS
- 4MB RAM 70ns
- Teac 1.44MB Floppy Drive
- VLB IDE/IO
- CONNER 210MB IDE HD
- Enhanced 101-key Keyboard
- VLB VIDEO with 1MB
- 1024x768 .28dp SVGA Monitor
- Mini Tower Case
- 230-Watt Power Supply

$999

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Maxtor 7546 540 MB 11ms IDE	***$350***
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Fujitsu M2624F 520MB 11ms SCSI	$440
Fujitsu M2694SA 1.0 GB 10ms SCSI	$750
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Maxtor MXT-340S 340 MB SCSI	$329
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Quantum LPS540S 540MB 12ms SCSI	$485
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- 16 bit Pro Audio Spectrum 16
- Deluxe Speaker
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- 1.44 Floppy Drive
- IDE/IO 2FD/2HD/2S/1P/1G
- 210MB IDE HD
- Enhanced 101-key Keyboard
- 32 Bit VLB SVGA Card w/1MB
- 1024x768 .28dp SVGA Monitor
- Mini Tower Case
- 230-Watt Power Supply

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- Built-in Track Ball
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- Call for more optional

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- AMI BIOS & MATH-Co Socket
- Internal Clock Battery
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- 1.44 MB Floppy Drive
- IDE 2FD/2HD Controller
- AT I/O 2S/1P/1G
- 200MB IDE HD
- Enhanced 101-key Keyboard
- Trident SVGA with 512K
- 14"SVGA Monitor .28dp 1024x768
- Mini Tower Case
- 230-Watt Power Supply

$759

IBM SLC2-66/64K

- IBM 486SLC W/Math-Co
- 2 VESA Local Bus Board
- AMI BIOS Internal Clock Battery
- 4 MB RAM 70ns
- 210MB HD
- 1.44MB Floppy Drive
- IDE 2FD/2HD Controller
- AT I/O 2S/1P/1G
- VLB VIDEO with 1MB
- SVGA .28dp SVGA Monitor
- Enhanced 101K Keyboard
- Mini Tower Case

$949

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DTC 2290 EISA IDE	$115
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US Robotics 14400/14400 Int. Fax/Modem	$110
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Colorado FC-10 Tape Backup Controller	$85
Colorado TC-15 Controller w/Compression	$185
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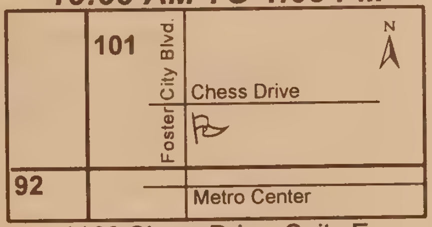

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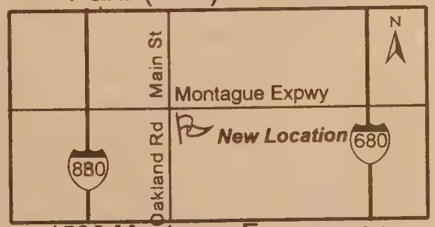

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Wrapping Up The Internet

New Software For A New Kind Of User

It's hardly news that the Internet and the applications used to access it are changing—the Internet has done almost nothing but change in its fifteen-year history. What's interesting is that the change is systematic. The Internet really does behave like a very large ecological system, and when, for whatever reason, one thing changes, others adjust.

The PC Connection

The big change is not the number—or the intelligence—of the Internet's users. Rather, it has to do with the hardware people use to get connected to the Internet, and how that connection is achieved. The hardware of choice for interacting with the Internet used to be something (a workstation or a larger, server-class machine) running UNIX. Gradually, the balance has shifted in favor of personal computers.

Connectivity used to be a matter of being permanently attached to a local network (usually TCP/IP-based) running on cabling (like Ethernet) with moderately good capacity for transmitting data. Connectivity is moving toward temporary connections established between personal computers and the Internet over ordinary phone lines, using the Point-to-Point Protocol (PPP) or some other scheme for moving packets over normal phone lines.

This change means three things. More Internet participants are using hardware capable of supporting graphical interfaces. The people with this hardware are communicating with the Internet over a slower connection (typically a 14.4kbps modem). The desktop hardware that is used to access the Internet can't be assumed to be on a local network, and consequently has less disk space available for the Internet user to store applications that use Internet resources.

Not surprisingly, users who find themselves trying to work with the Internet on a standalone desktop computer have different application needs than users with a permanent network connection, more powerful hardware, and mega-oodles of disk storage capacity.

Internet Software, New And Classic

In the past, Internet applications were a mixed bag of discrete utilities. The basic suite of utilities packaged with UNIX includes ftp, telnet, ping, email, whois, and finger. In their most common forms, these utilities presume as little as possible about the display environment (they can all be used from ASCII terminals), and they are all single-protocol applications. Telnet and finger share a protocol; ftp, ping, and e-mail all have protocols of their own. None of the basic Internet tools uses more than one protocol.

As the Internet community grew, its members developed a number of applications that were donated to the community at large. These include innovative tools for reading mail; tools for reading and distributing USENET news groups, archie, gopher, the WorldWideWeb, Internet Relay Chat, and the like.

The applications created in the Internet community are more diverse than the bundled software, and show greater interest in taking advantage of display technology. Given an interesting application, sooner or later someone will create a version for most of the popular GUIs in use today.

The community-developed applications also boast friendlier interfaces (menus, less terse help, and so forth) than the older bundled applications. The user-developed software also tends to interact with other programs more smoothly. Gopher, for example, offers the user the ability to distribute items read through gopher via email.

> The hardware of choice for interacting with the Internet used to be something running UNIX. Gradually, the balance has shifted in favor of personal computers.

In general, however, the community-developed applications have also been single-protocol programs. Gopher can start e-mail or ftp clients, but it doesn't provide an interface to all their features. (WWW browsers, able to interact with Gopher servers, were an early hint that applications could work with more than one protocol effectively.)

Much of the community-developed software consists of standalone utilities (file compression programs, viewers for graphical images, players for sounds, for example) to support interesting features not yet integrated with the applications for accessing network resources.

The community's contributions also reflect the styles and preferences of their creators. There are email readers and network news readers for every taste. Gopher users working under Windows have no fewer than three clients from which to choose, and browsers for the WorldWideWeb exist in similar profusion.

Over the past few years, a novice Internet user could get a practical education in computer basics by shopping around among all the different applications and utilities published in the Internet community.

The All-In-One Connectivity Package

As the balance in typical hardware and connectivity has shifted from UNIX computers with permanent network attachments to personal computers only intermittently connected to the Internet, application development has also shifted away from the notion of a separate tool for each network application. The new trend in Internet application development is

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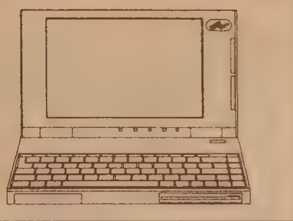

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toward integrated packages featuring multiprotocol applications, capable of using a known and powerful graphic display environment, and optimized for serial line access.

This new trend is represented in at least three different ways of packaging Internet applications.

The first of these is an extension of the community-developed Internet applications and is best represented by the NCSA Mosaic browser for Windows. Mosaic uses a standard Windows socket interface (the winsock API) and will run with any network software that uses that API. Mosaic provides access to servers for both the WorldWideWeb and Gopher. With clever programming of WWW servers, Mosaic has interfaces to other Internet applications (ftp, finger, X.500, and whois). In keeping with the spirit of the web, Mosaic incorporates the ability to display in-line graphics images.

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A second approach to repackaging Internet applications is to establish a suite of GUI-based Internet clients that can be bundled with network protocol implementations. This is not unlike the original "software tools" approach taken by the UNIX vendors, but it's taken a long time to establish adequate packages of Windows applications. The applications in this kind of package may not be integrated, but they at least coexist in a single folder and use Windows in a consistent way.

NetManage's Chameleon products are an example of this kind of package. NetManage is a network software vendor; its Chameleon products package TCP/IP and PPP implementations with a number of Internet application clients for Windows. (There are two Chameleon products, one a full TCP/IP implementation, one that's PPP only.) None of the Chameleon clients is multiprotocol, but they all look and behave consistently. You'll still need supporting utilities to do things like image display, file compression, and uuencoding.

Chameleon includes some interesting extras. One is a Visual Scripting Language for developing other tools sharing the same look and feel as the included client programs—an industrious user could whip up a GUI interface for uudecode, for example. There's also an ftp server for Windows that allows the user to publish files for other users to download. Chameleon's network connectivity is general purpose: it can accommodate any winsock compliant clients.

Finally, there are tightly integrated packages that provide a network protocol implementation and access to a collection of Internet applications within a single program. The new

continued on page 242

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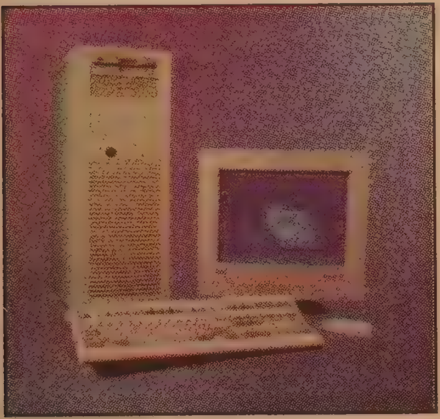

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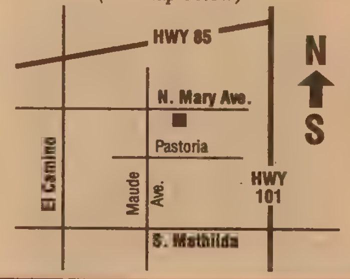

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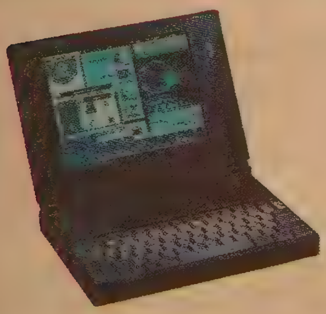

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LANS • BY PETER JOHN HARRISON

What To Do When Your NetWare Server Crashes

A Short Course In Using NetWare's Volume Repair Tool, VREPAIR

Sooner or later, it'll happen. Your NetWare server will crash, and when you power the system back up you'll see a little message: "Block allocation size does not match" or some other error message telling you that one of your NetWare volumes couldn't be mounted due to some sort of data error. It's time to roll up your sleeves and take a crash course in the NetWare volume repair tool, VREPAIR.

It happened to me recently. Murphy's Law was in full swing the day before April Fools, the last day of the quarter, when a SIMM memory card failed, causing a parity error that crashed the Accounting server.

NetWare keeps two copies of its Block and File allocation tables on disk. When a file server goes down suddenly during a disk update, these tables can get out of sync. The same holds true if the server has "mirrored" drives (two drives with duplicate or "mirror" copies of each other's data), and NetWare goes down before it has had a chance to write a change to both drives. Later, when you try to bring the server up, NetWare checks the integrity of these files, and refuses to mount any NetWare volume if they don't match. When this happens you have two options: initialize the volume and reload it from tape, or attempt to salvage the corrupted drives using VREPAIR.

VREPAIR inspects the primary and secondary copies of each table and disk volume, and tries to make an educated guess about which table entries are correct, and which entries have been corrupted. It can be a scary process, sitting there watching VREPAIR as it tries to weed out the good and the bad entries on your disk. Nine times out of ten, VREPAIR is able to make sense out of the two sets of allocation tables. One time in ten, it fails, and you have to reload from tape—meaning your users lose all the work they've done since the last backup.

> Oftentimes VREPAIR doesn't fix all the problems on its first pass, so when you get back from coffee, run VREPAIR a second time.

VREPAIR is understandably the most feared command in the NetWare command set—most LAN administrators rarely have to use VREPAIR, so they never get comfortable with its operation, and when they do have to use it, it's always in a "crisis situation." Despite its reputation, VREPAIR is actually pretty easy to use. The key to making a swift and smooth recovery with VREPAIR is planning ahead.

First, you need to copy VREPAIR to diskette, and store the diskette near the server, so it'll be right there when you need it. Then, just once in a while when you have to take the server down for maintenance anyway, try DISMOUNTing a NetWare volume before you DOWN the server, and run VREPAIR (don't worry, VREPAIR won't damage a disk in good working condition). Go over the NetWare documentation for VREPAIR in the Systems Administration manual, and make sure you feel comfortable with the command. That way you won't have to familiarize yourself with a new command while the entire accounting department wanders by, one by one, to ask you when the server will be up.

When disaster does strike, here are some helpful hints and tips. First, when you start VREPAIR using the command LOAD A:\VREPAIR, you should set the VREPAIR option so that it doesn't pause after each error (this will help preserve your sanity), but do select the "log errors to a file" option (this will create a list of files that VREPAIR considers "suspect," and may be damaged). You should also make sure that the "Write only changed directory and FAT entries out to disk" option is set (this is the default), and I like to set the "Write changes immediately to disk" option. Once you've set these options, select the "Repair a volume" from the VREPAIR menu and go get a cup of coffee. VREPAIRs usually take a while.

Oftentimes VREPAIR doesn't fix all the problems on its first pass, so when you get back from coffee, run VREPAIR a second time—it shouldn't take long this time around, then exit VREPAIR and try to MOUNT the VREPAIRed volume.

This is the moment of truth. Either VREPAIR will have fixed the corrupted volume, and the volume will "mount" normally, or you will have to use INSTALL to delete and re-create the damaged volume, then reload from your most recent backup tape.

As it so happened, Murphy was smiling on the accountants. After installing a new SIMM on April first, VREPAIR ground away for half an hour trying to make sense of the Accounting Server's mirrored drives, but it fixed the problems, and I didn't have to reload from tape.

After that, all I had to do was convince the guys in accounting that the whole thing wasn't some elaborate April Fools Day prank. I wonder what they meant by "just wait 'til next year..." ■

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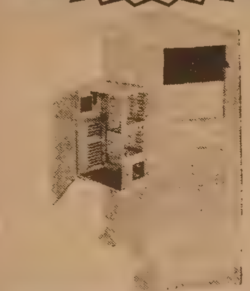

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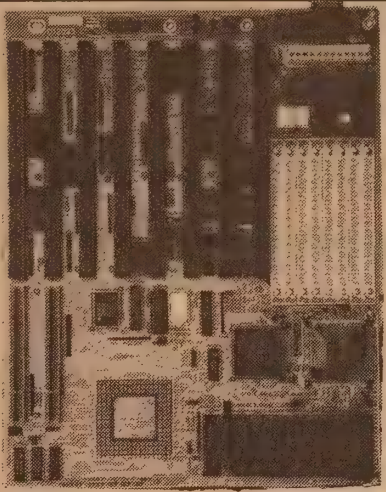

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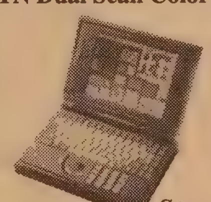

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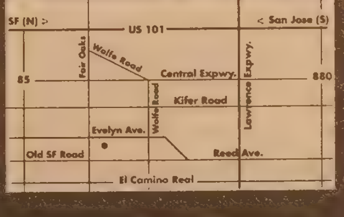


OS/2 • BY FABIAN PASCAL

Scanning For OS/2 Scanning Solutions

In previous articles I documented the difficulties of image processing under OS/2—for example, incorporating in Freelance presentations images other than those generated by Freelance's own graphing and charting facilities. I use a lot of clips from the trade press as examples in my presentations, and to date I've had to type their text into Freelance. Not only is this a tedious waste of time, but it also fails to produce the same effect that the clips themselves would, were they displayed on-screen.

A further problem is that the highest resolution at which Freelance for OS/2 can display images is just about 75dpi. Import tests with TIFF files in the 75–300dpi range showed that the images wouldn't be legible regardless of the file resolution. That forced me into a compromise I don't particularly like: use only my own (bulleted) text in Freelance slides, and transparencies for clips and graphics.

The easiest way to produce transparencies is at a copy store. But with many presentations and clips, this isn't cost-effective at $2.50 ($4 for color) a pop. Moreover, producing the transparencies with Freelance would be better, because it permits custom footers; more importantly, it can also print handouts at four or six frames to a page. Thus, if the clips could be scanned into TIFF files and imported into Freelance, I could produce my own transparencies and handouts.

Now, there are Windows image processing applications that support the TWAIN standard, and thus can be used to scan documents and edit the resulting images. Some provide their own presentation facilities, but also save the images in one of many graphics file formats (e.g. TIFF, PCX, BMP, etc.). Since all scanners come with Windows drivers, I could, for example, scan the clips using a Windows application and save them as TIFF files, which Freelance imports.

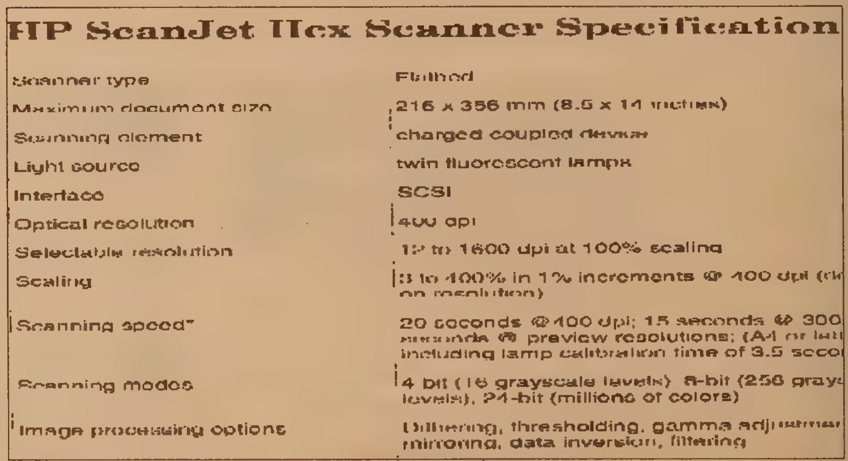
However, I am not and won't ever be interested in any form of Windows whatsoever. What I want is pure and good OS/2 solutions.

I am not and won't ever be interested in any form of Windows whatsoever.

What I want is pure and good OS/2 solutions.

The ScanJet IIcx

Hewlett-Packard recently shipped the latest member of its scanner family, the ScanJet IIcx. Judging from its specifications (Figure 1), at a little under $1000 it seems both adequate and affordable for the needs of the average PC user.



HP ScanJet IIcx Scanner Specification

Scanner type	Flatbed
Maximum document size	216 x 356 mm (8.5 x 14 inches)
Scanning element	charged coupled device
Light source	twin fluorescent lamps
Interface	SCSI
Optical resolution	400 dpi
Selectable resolution	12 to 1600 dpi at 100% scaling
Scaling	3 to 400% in 1% increments @ 400 dpi (d on resolution)
Scanning speed*	20 seconds @400 dpi; 15 seconds @ 300 seconds @ preview resolutions; (A4 or lett including lamp calibration time of 3.5 seco
Scanning modes	4 bit (16 grayscale levels) 8-bit (256 grays levels), 24-bit (millions of colors)
Image processing options	Dithering, thresholding, gamma adjustmen mirroring, data inversion, filtering

FIGURE 1

The IIcx, however, comes with an HP proprietary ISA SCSI adapter. I already have a DPT EISA SCSI adapter which yields better performance (very important with large graphics files produced by scanning), so why waste another EISA slot on a slower adapter just for the scanner, which defeats the whole concept behind SCSI? Particularly when the HP adapter comes only with a Windows driver

While OS/2 comes with an .ADD for the DPT adapter, I explained in a previous column that for the IIcx to work, another driver (bearing the .SYS extension) must be provided, usually by the scanner maker. HP does not provide one, but fortunately, another company does. Danmar's SCSIScan driver allows third-party SCSI adapters with an OS/2 .ADD driver to talk to ScanJet scanners. Most popular SCSI adapters are supported including my DPT (check with Danmar if you have a less common adapter).

With the scanner properly connected to the SCSI adapter—it is recommended that the scanner should be the last (terminated) device on the SCSI chain—the driver's installation is very simple. When you type INSTALL at the OS/2 prompt, you are asked for the boot and driver drives. The driver is then copied to your hard disk and the following statement is inserted in your CONFIG.SYS file:

```
DEVICE=path\SCANOS2.SYS
```

Reboot; if everything is OK, you will see a message notifying you that the scanner is recognized and the driver is loaded.

Now What?

You're ready to scan. The question is: How? The real solution would be, of course, the ability to scan directly from Freelance, but as of now no such plans have been announced. So what you need is OS/2

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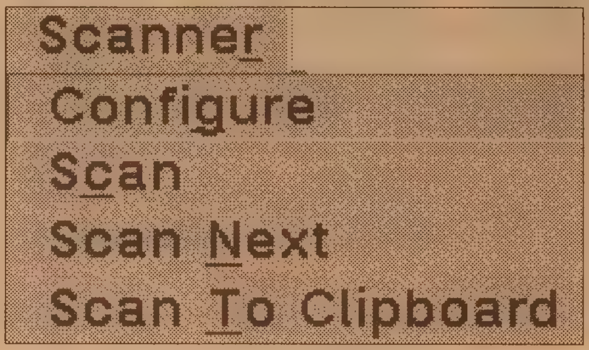
Even if OS/2 full-fledged image processing applications (e.g. CorelDraw) offered scanning capabilities, you might not want to get into them for simple things like press clips. Ditto for sophisticated document management software (IBM offers one with scanning capability) which fulfill corporate needs. The fact is that as of this writing there are no scanning applications for OS/2 equivalent to HP's DeskScan. In the meantime, the only thing I could come up with is a quick-and-dirty utility from Imara Research.

ScanTool

ScanTool was whipped up at the request of customers of Imara's document management system, who were frustrated by the lack of ability to scan documents under OS/2.

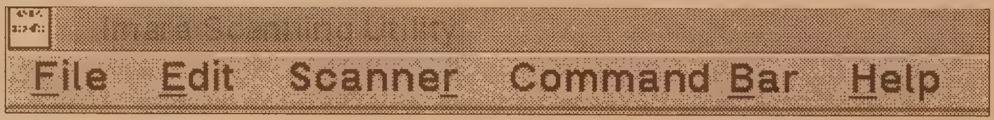
FIGURE 3



The nice thing about ScanTool is its simplicity and ease of use. When you invoke it, you get an empty window with the main menu shown in Figure 2.

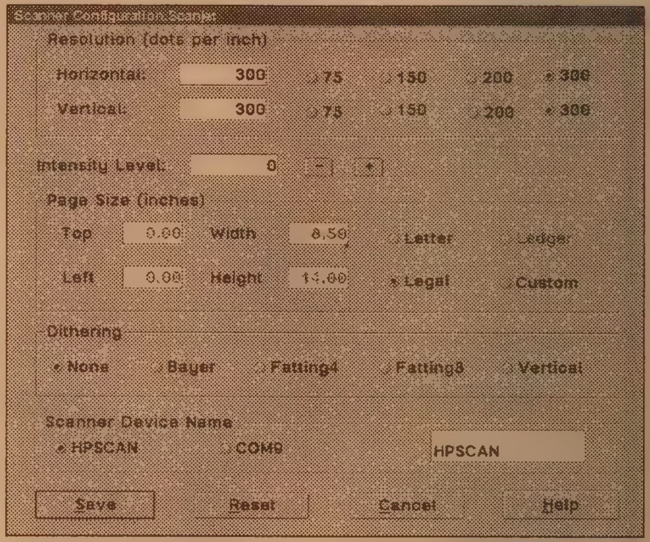
You can set the kind of scanning you want in two ways. For the menu-driven approach, select the Scanner option from the main menu (Figure 3), and its Configure option will get you the settings box in Figure 4.

FIGURE 2

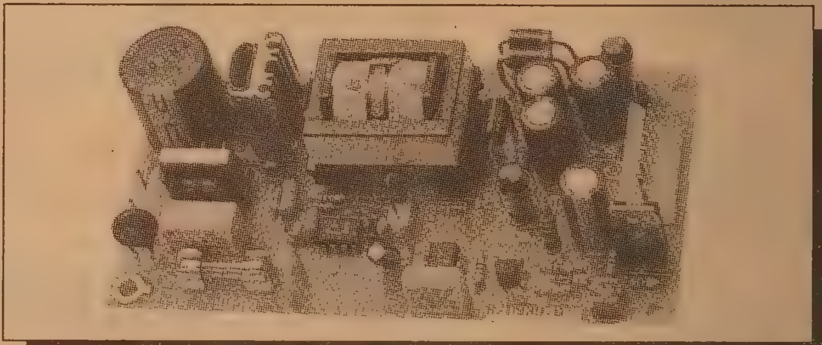


You can chose from among four vertical and four horizontal resolutions and adjust the intensity level and the page size. For shaded or color documents you can opt for one of four dithering options, which are different dot-based emulations of shades of grey. The COM9 option is remote scanners on LANs. The selected settings can be saved, and will apply to all scans until changed.

FIGURE 4


Resolution (dots per inch)
Horizontal: 300 ○ 75 ○ 150 ○ 200 ● 300
Vertical: 300 ○ 75 ○ 150 ○ 200 ● 300
Intensity Level: 0
Page Size (inches)
Top 0.00 Width 8.50 ○ Letter ○ Ledger
Left 0.00 Height 14.00 ● Legal ○ Custom
Dithering
● None ○ Bayer ○ Fatting4 ○ Fatting8 ○ Vertical
Scanner Device Name
● HPSCAN ○ COM9 HPSCAN

continued on page 172



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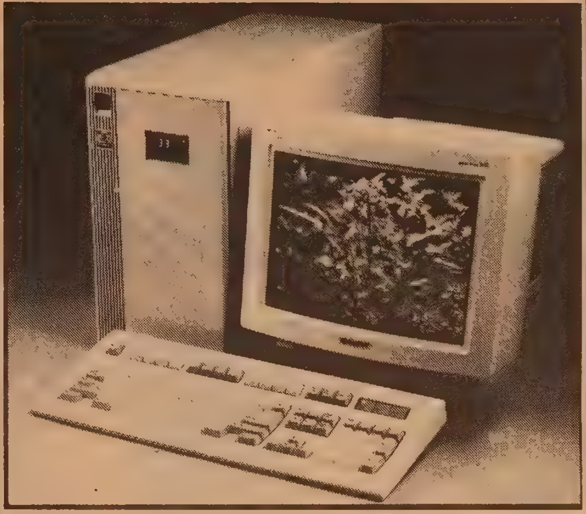

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BY RICHARD CLARKE

Protecting Your Sales & Marketing Data

Avoiding Some Of The Main Risks Facing The PC-Based System That Now Runs Your Business

In today's highly competitive business environment, companies are discovering that they can improve their operating results by applying PCs and the appropriate software (contact management systems, and often a "suite" of other computer tools, such as email, presentation, expense reporting, and proposal generation software) to their marketing and sales functions. These tools improve a salesperson's productivity, reduce sales support costs, and help a company get the most from each customer relationship. As the sales and marketing groups start to depend on these systems, the company's success will also begin to depend on them. But how do you make sure that the tools are there when you need them? How do you protect yourself and your company? That is the focus of this article. The main perils are disk drive failure, theft or loss of laptop computers, corrupted files, and the security of your accumulated information.

Disk Drive Failure

We've all heard the story, someday every disk drive will fail. The solution that we all have heard, too, is that you have to regularly back up. What does this mean for a sales and marketing organization? What does this mean for a networked system as opposed to a distributed system of laptops? How do you get salespeople to actually perform backups?

If you operate on a local area network, a versatile and popular option is to invest in a tape drive for daily backups. You should keep the previous week's worth of backups on-site at your company and the week-ending backups in a location off-site. What if there is a fire, flood, or earthquake, and the office is destroyed? How will you get back into operation without your critical customer information?

For the salespeople with remote desktop or laptop PCs, the problem is different. Each salesperson can do their own daily backup, in which case the company should provide an easy method for doing this. Another option is to use "remote database synchronization" capabilities, giving you a centralized system for a secure backup of everyone's data.

Theft Or Loss Of Laptop Computers

It is almost inevitable that at some point one or more of your staff's laptop computers will get lost or stolen (or broken, like when it was set on the roof of the car to unlock the door, then the salesperson drove off and forgot to put the laptop in the car). This is a problem! Not only do you lose the hardware, but you lose the data the salesperson uses to operate. Thus you need a strategy for hardware, software, and data.

The hardware issue is fairly straightforward. Some companies that depend on laptops in sales find that laptop problems are so common that they have to allow for the availability of 10% of the total field population in any given month. There are two kinds of choices you can make. Either have spare machines in your company, or arrange for the immediate availability of spares (perhaps on a rental basis) from the company you bought the laptops from.

> As the **sales** and marketing groups **start to depend on** these systems, the company's **success** will also begin to depend on them. **But how** do you make sure that the **tools are there** when you need them?

When you start to consider software, the issue becomes more complicated. First, the contact management program your salesperson uses is probably "tailored" for your specific company. This "tailoring" usually involves modifying what are called "custom user fields" (and often, screens, letters, lookup data, etc.) so that they apply directly to your business. When you install the software on the replacement laptop, you need to be able to install the tailored version of this software, and so you need to make sure that you have both the standard contact management software and the "tailored installation set" available to install on new machines. Also, since this class of software commonly "evolves" as it is used within a company, you have to have the correct version of the tailored software available. Usually the tailoring involves the modification of a few specific files. Also, often, the software vendors have some form of copy protection (or serial number protection), so that you cannot just copy all files to the new system. If you have worked with a consultant to set your system up, ask your consultant to make a copy of the tailored installation set. Keep it on file, and make sure that as updates and modifications are made to your system, they are reflected in this dataset. If you are doing the tailoring and installation within your company, then you will need to work out the details with your software vendor. In this case, as you are selecting software, you should make sure that the vendor will support you in this; otherwise, select another vendor!

Once you have solved the issue of exactly what software needs to be on the laptop, you need to consider whether to have it preloaded on your internal company spare laptops (or available spares at your laptop vendor), or to load it as needed. The issue here is how long the salesperson who has lost his machine will be "down." To get the salesperson back in full operation means that he will need a new machine, with the correct programs and data loaded. If he is using a laptop, then often he will be in a location away from company headquarters, so the machine will need to be sent

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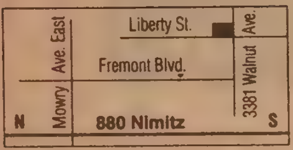

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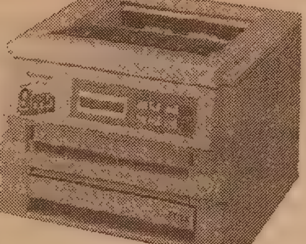

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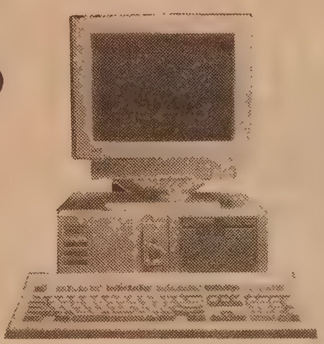

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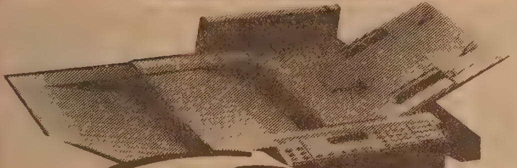

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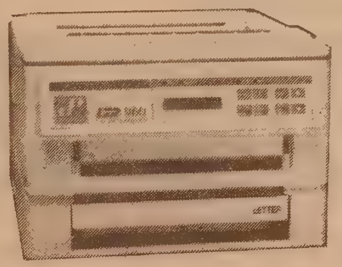

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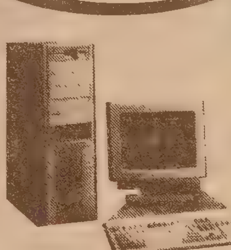

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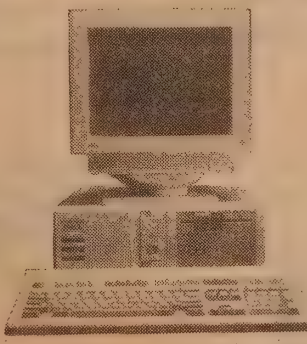

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via priority freight. The longer it takes to get your hands on a machine and load the software, the greater is the risk of losing yet another day due to missing overnight shipper's deadlines. What is a day's sales from one salesperson worth to your company? The answer to this question will help you understand what alternative is the correct one for your business.

As far as the existing data in the system, if you have a solid, daily backup routine as defined above, then it is easy to get the current, correct data on the new computer. Otherwise, the salesperson's data must be rebuilt, which will keep them at low effectiveness for some time. In all of this, backups are key to ensure your successful use of PCs in sales; they protect against more than just disk drive failure.

> Database **synchronization** is one of the **keys** for the company with distributed **sales data.**

Corrupted Database Files

One thing that is seldom discussed but is an ongoing problem with database files is corrupted files. Ironically, database files typically remain open throughout the business day. They can be corrupted (a data change that makes the file unreadable) by a variety of methods. Some common problems are shutting down the system when the program is open (or leaving the laptop on while driving the car around town and running the battery down), power surges, interactions with memory resident software, or disk drive/controller problems. Sometimes the contact management system will be able to operate with minor corruptions, but as they accumulate, then suddenly the message "Corrupted datafile" might appear and the system is no longer usable.

Were it not for the issue of accumulating corruption, the easy answer to this problem would be "backup." But what happens if your backup editions are corrupted? Luckily, there is a category of software that will diagnose, and often fix, corrupted files.

The answer to preventing (or at least minimizing) this type of database failure is using one of these programs to check the database file *before* it is backed up. Part of your safety net, also, is a good copy of the "header record," the record that defines the contents of a file. A corrupted header record makes the whole file unreadable. A good database corruption program will allow you to make a copy of the header record, and will allow you to apply this header record to a file with a corrupted one. The program that I use for these pur-

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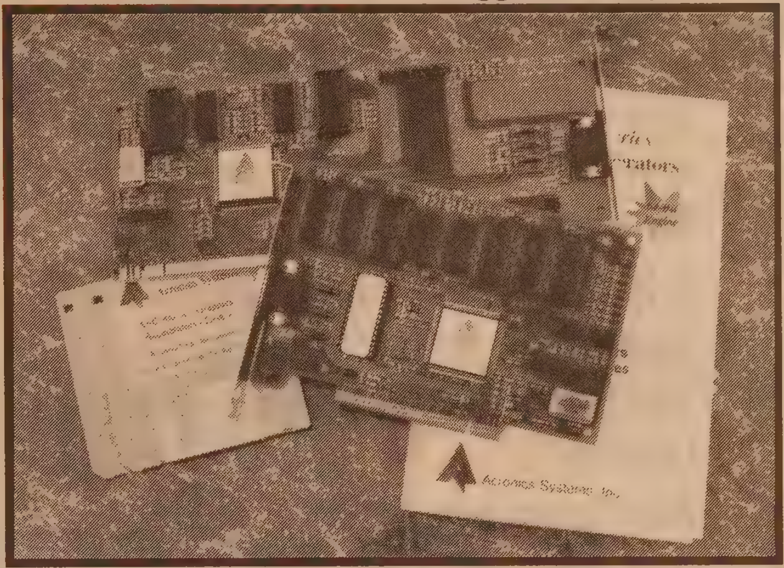

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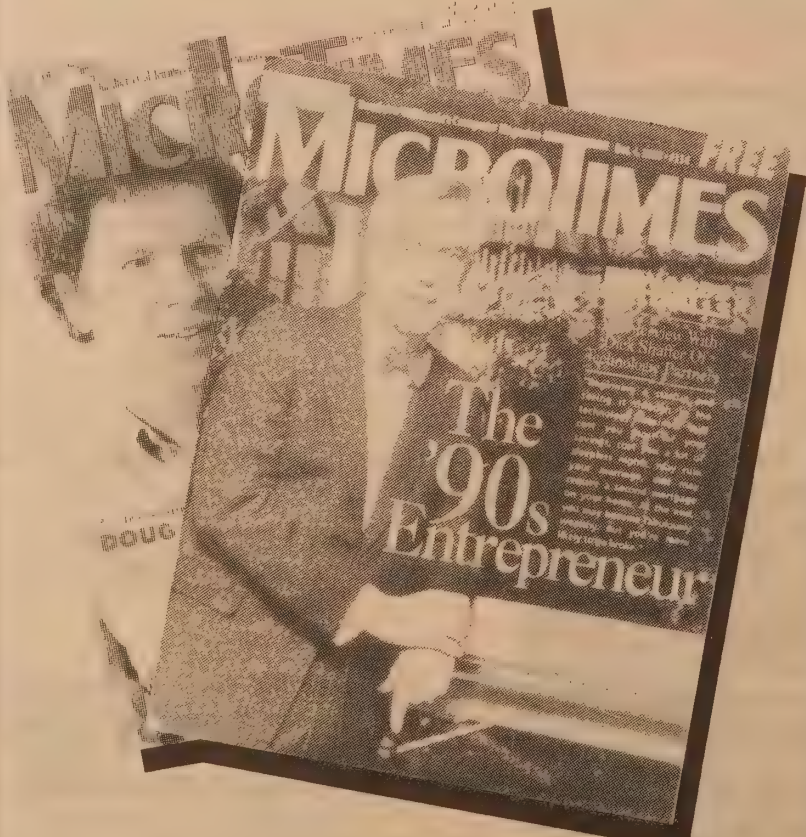

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This kind of problem also is an argument for the use of contact management systems that are built from standard rather than a proprietary database. The proprietary database will probably not have database recovery tools readily available.

Database Synchronization

Database synchronization is a technique whereby separate copies of a database can both be in use, say at headquarters and in a field office or laptop, and the data that is changed is exchanged and updated (synchronized) in each system. Database synchronization is one of the keys for the company with distributed sales data. The data in the contact management system consists of "static" information, such as customer name and address, and "transactional" information such as schedules, notes, and contact history. A good database synchronization approach will take all the transactional information as a part of the synchronization routine. For the static data this technique, such as using date flags associated with each field, will need to tell the system when it was last updated. The database synchronization program will strip out the revised static data, compare it with the data in the new system, and will accept the most recent data as valid, and update the other system with this data.

One approach to database synchronization and salesperson system backup is to run database synchronization at the close of the day and send them to headquarters via email. This way headquarters always has current information, and the backup "safety net" can be maintained centrally by system staff, not field salespeople.

Security

Many companies consider their customer lists to be the most confidential information they have, so security of the sales system is of great concern. A sales automation system often will have information not only as to who the customers are, but also about what they are buying, how much they are paying, and details of company and buyer preferences. Once you gather this information together for your salespeople to use, how do you protect against this same information being misused? Once again, the situation is different for the networked system at headquarters, and the standalone or laptop computers in the field.

For the networked computer, one element of security relates to what specific information a person can access from the system. If this is a concern, you should ask pointed and direct questions of your consultant or software vendor. What is the security system? How does the system protect access to information by people other than the salesperson responsible for the account? Also, does the system prevent non-qualified users from functions that allow them to delete records, perform mass data changes, or modify system settings? If not, then the software is not appropriate for your company. Also, many companies want to be protected against a salesperson leaving the company and taking the customer lists with them. This can be very diffi-

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cult to stop, but you can at least make it harder for them. One easy technique is to redirect the floppy drives in the AUTOEXEC.BAT file, so that a salesman cannot copy any files from his system. Another technique is to use the security system to limit the kinds of reports that a salesperson can print out. Do you want him, for example, to be able to print a complete "phone book" for all your company's customers? I think not.

The problem is different for computers that are not connected to the network, but there are good software tools that can be used. For the laptop or remote desktop computer the security concerns go beyond just protecting your company against an employee who wants to take a customer list with him to a new company. You must protect against an unethical competitor as well. You may also want to consider protecting the security of your mobile network communications.

A new class of software, security systems, can provide the security needed. A well-designed program will encrypt the hard disk, so no information can be obtained from the disk, even by sophisticated techniques. It will also let you lock out copying to the floppy disk (except for uses that you have specifically allowed), and it lets you encrypt files that you want to transfer by modem or mobile communication link. A good system also will not be noticeable in terms of operating speed, either. PC Dynamic's Menu Works Security looks to be the "best of class." A US Navy team rated it #1 of the seventeen that they evaluated.

Conclusion

Marketing and Sales Automation can improve your company's results. You will find as you start using the tools that your company will come to depend on them to operate. You have to insure your ability to operate. This means developing the discipline to perform routine backups (both in the main office and from computers in the field), developing techniques to insure file integrity, establishing a system to replace and reload lost or stolen laptops, and developing security systems that will protect your valuable information from both unethical competitors or disgruntled employees. All of these are possible, but require forethought, planning, and an appropriate level of operating discipline. ■

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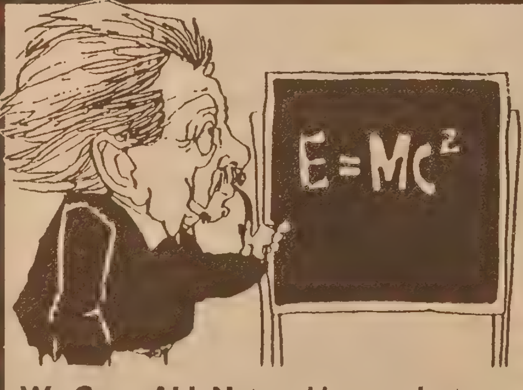

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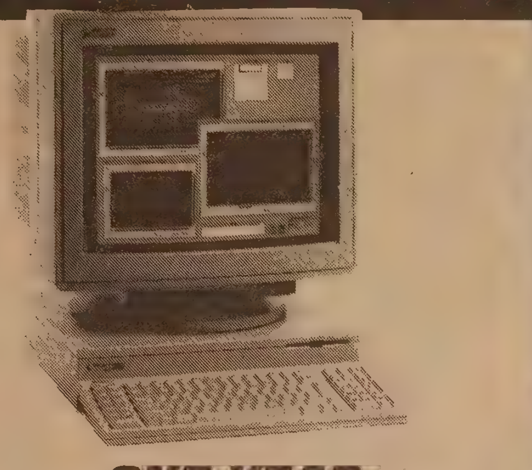

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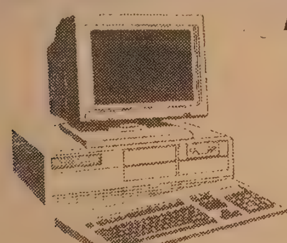

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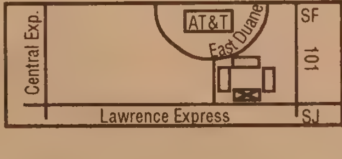

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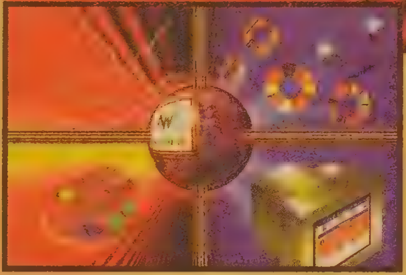

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Action LaserII-2/3/5 MB	159/205/299

HP LASER

Item	Price
HPII/IID 2/4 MB Board	$120/215
HP 4/4M 4/8MB	169/309
HP IIP,IIP+,III,IIID,IIIP 1/2/3/4	99/135/219/215
IIsi 4/8 MB	179/299
DeskJet 500/500c 550C 256K	89
Design Jet Plotter 4 MB	155

PANASONIC LASER

Item	Price
KXP4410/KXP4430 1/2/3/4 MB	$119/150/175/225
KXP4420/4450/4451 1/2/3/4 MB	119/145/159/225
KXP4450 1 MB	119
KXP4455 2 MB	139

OKI LASER

Item	Price
OL400 1/2 MB Board	$109/129
OL800/820 2/4 MB Board	129/189
OL810 2/3/4 MB Board	159/189/229

QMS LASER

Item	Price
PS 410 2/3/4 MB	$119/165/189
PS 860, 1700 1/4/8 MB	89/133/179
PS 815, 825, 815MR, 2/4/6	168/232/295

SHARP LASER

Item	Price
9500PS 1 MB	$75
JX-9500/9700 1/1.5/2.5/4	110/135/188/344

OTHERS

Item	Price
Apple Laserwriter II/IINT/IINTX 4 MB	$235
Brother HL-4 2/3/4 MB	119/165/189
Brother HL-8E V 1/2 MB	99/139
Compaq Pagemarq 15 & 20 1/4/8	79/139/266
Kyocera F800, F800Am F800T 2/4	95/137
NEC Silentwriter 90/290	109/124
NEC Silentwriter 95 2 MB	109
TI Microlaser 1 MB	98
Packard Bell Video Memory 1 MB	39

DELL MEMORY

Model		P/N	
433P,33P,325P,33D,325D			
	1 MB	310-2505	$89
	4 MB	310-2507	169
433TE, 425TE & Powerline Workstation			
	2 MB	310-2466	$129
	4 MB	310-2467	189
	8 MB	310-2468	349
	16 MB	310-2469	669
Power Desktop 486D, D/33, D/25, D/20, D/66			
	1 MB	310-2505	89
	4 MB	310-2507	169
	16 MB	310-2625	669
OTHER MODELS			CALL

MEMORY BOARDS

Item	Price
RAMpAT 16 Bit	$85
RAMpAT Plus	125
SIMMply RAM for PS/1 16 Bit	149
SIMMply RAM	159

TEAC FLOPPY DRIVES

Item	Price
1.44 MB	$39
1.2 MB	49
Dual Floppy 1.2/1.44	85
Heat Sink w/Fan For 486's/Pentium	10/18

COMPAQ MEMORY

Model		P/N	
LTE 286	1 MB	117081-001	$89
	2 MB	117081-002	125
	4 MB	117081-003	219
SLT 286	1/4 MB	110237-001	99/259
LTE 386S/20	2 MB	12125-001	129
	4 MB	121125-002	225
Contura Lite 20/25			
	2 MB	129769-001	125
	4 MB	129769-002	245
	8 MB	129769-003	395
Portable 386	1 MB	107651-001	125
	4 MB	107653-001	310
Portable III	2 MB	10-7332-001	125
	EBD	167811-001	225
SLT 386	2 MB	118304-001	135
	4 MB	118305-001	225
Deskpro 386S (E. Board)			
	4 MB	11364-001	285
	4 MB	112534-001	189
Deskpro 386/33L, 486/33L, 50/25			
	2 MB	115144-001	105
	8 MB	116561-001	365
	32 MB	116568-001	1475
Deskpro 386/20e, 25e (E. Board)			
	4 MB	113645-001	285
Deskpro 386/20,20e,25e			
	4 MB	113132-001	199
Deskpro 286N, 386N, 386SX/20, 386/25M, 486/33M, 486S/25M, 486S/16M			
	2 MB	118689-001	189
	4 MB	118690-001	345
	8 MB	128877-001	395
Deskpro 486/33L, 486/50L, 386/33L			CALL
Prolinea 3/255 & 3/252S			
	2 MB	141738-001	135
	8 MB	141742-001	315
Prolinea 4/33	2 MB	141682-001	125
	4 MB	141684-001	189
	8 MB	141685-001	345
Other Models			CALL

TOSHIBA MEMORY

Model	Memory	Price
T8500, T5200	2/8MB	$129/449
T5100, T3100, T1600	2 MB	139
T3100SX	2/4 MB	129/159
T3200SX, SXC	2/4 MB	125/199
T4400SX, SXC, T6400	2/4 MB	135/249
T4500/4600/4800, T1900/1910, T1950/C 3.3 Volts	8/16 MB	429/769
T3300SL	2/4/6 MB	135/210/299
T3100	2 MB	135
T2200SX, SXE, T1000LE	2/4/8MB	135/210/379
T1800 Satelite	2/4/8 MB	135/210/379

NEC MEMORY

Model	Memory	Price
Prospeed 286, 386SX/16	1/2/4 MB	$125/185/269
Prospeed 386	2/4 MB	189/475
Prospeed SX/20	1/4 MB	125/249
Powermate 386/25S	2/8MB	139/369
Powermate 486/25E, 486/33I	2/8 MB	135/365
Powermate Express Series	1/4/16 MB	135/225/689
Other Models		CALL

NOTEBOOK MEMORY

Model	Memory	Price
AMIGA 4000	4/8 MB	169/310
Altima LSX	2/4 MB	165/249
Avanti	2/4 MB	160/340
AST Premium Exec	1/4 MB	119/245
AST Power Exec 3/25	4/8/16 MB	CALL
Compaq Contura Lite 20/25	2/4/8 MB	135/245/395
Chaplet Notebook	2/4 MB	155/249
Chicony 386SX	4 MB	198
Chicony 386SL/25	2/4 MB	119/229
DECPC 320P	2/4/6 MB	195/269/389
DELL 320N &212N	1/2 MB	99/125
DELL 320N, NC	2 MB	125
DELL 325N, NC	2 MB	179
DELL NL25, NL20	2 MB	179
Epson NBS3	1/4 MB	98/225
Everex Tempo LX	2 MB	135
HP 95LX	1/2 MB	159/279
IBM L40SX, N33/SX	2/4/8 MB	99/189/389
IBM N51SX & SLC	1/4/8 MB	99/155/299
IBM PS/2 N45 Sl	2 MB	179
MAC PB 160, 180	6/10 MB	249/425
MAC PB 140, 170	2/4/6 MB	89/175/229
MAC PB 100	2/4/6 MB	89/179/239
Magnavox Metalis 386SX	4 MB	199
NEC Ultralite 286F	1/4 MB	99/199
Packard Bell 386SX	1/4 MB	99/229
Panasonic CF 170/270/370	1/2 MB	65/99
Sharp PC 8501	2 MB	125
Sharp 678/6881	2 MB	129
Sampo NB SX/26, SX/25	2/4 MB	145/225
TI Travelmate 2000	1 MB	110
TI Travelmate 3000	2 MB	135
TI Travelmate 4000	4 MB	229
Zenith Turbosport 386 E	1/4 MB	125/325
Zenith Supersport SX	2 MB	189
Zenith Mastersport	2 MB	189

IBM PS/2 & PS/1 MEMORY

Model	Memory	Price
PS/1 286/386SX	2/4 MB	$135/225
PS/1 Consultant Essential/Expert	1/2/4/8 MB	79/99/189/320
386 Valuepoint	2/4/8 MB	99/179/325
486 Valuepoint	4/16 MB	189/595
PS/2 30-286	2 MB	99
50Z, 55SX, 65SX, 70	2/4 MB	99/179
40SX, 35SX.35SL	2/4 MB	99/179
70A21, A61, 121	2 MB	135
80-11, 121, 311	4 MB	245
95,90,P75, PS/1 Pro	2/4/8 MB	135/129/335
16 Bit Exp Bd For 50, 50Z, 60, 65SX	0K	179
32 Bit Exp Board for all 70 & 80 models	0K	189
RISC 6000	16/32/64 MB	745/1490/2890
Other Models		CALL

AST MEMORY

Model	Memory	Price
Bravo 3/33(LC) 325S	2/8 MB	$120/325
Bravo 486/25 & 4/33	2/8 MB	135/345
Bravo 486LC	4/8/16 MB	189/325/595
Cupid-32 Board	0K	239
Premium 386C	4 MB	189
Premium SE 450	4 MB	189
Premium 386/25, SX,33,486/25	1 MB	85
Premium II 386, 486	1/4 MB	85/189
Executive Notebook	4 MB	189
Other Models		CALL

SUN MEMORY

Model	Memory	Price
SPARC SLC	4 MB	$189
3/60, 80, 4/40, 60, 65	4/16 MB	189/795
SPARC 1 &1+, 1Pc	4/16 MB	189/795
SPARC 10	16/64 MB	745/CALL
SUN Classic	16 MB	745
SPARC Server 630np	64 MB	2285
SUN IPX, ELC	4/16 MB	189/795
SPARC II	16 MB	795
Other Models		CALL

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- 101 Enhanced Keyboard

486DX-50MHz 128K Cache

w/Intel 80486-50MHz CPU $565
w/Cyrix CPU $515

- 1MB Expandable to 32MB on Board
- 8K Internal Cache
- 128K External Cache Exp. to 256K
- Shadow RAM
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

486DX-33MHz 128K Cache

w/Intel 80486-33MHz CPU $450
w/Cyrix CPU $395

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- 8K Internal Cache
- 128K External Cache Exp. to 256K
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- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

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Intel 80486SX-25MHz CPU

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- 8K Internal Cache
- Shadow RAM
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop case w/power supply
- 101 Enhanced Keyboard

486SX-33MHz w/128K Cache **$315**

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AIR VESA Local Bus Motherboard	Add $50
VESA IDE Card	Add $15
VESA/EISA Motherboard	Add $120
PCI Motherboard	Add $120
VESA SVGA Card w/1MB	Add $70
SpeedStar 24X	Add $80
Orchid Celsius w/1MB VRAM	Add $135
Orchid Fahrenheit VLB w/1MB	Add $135

OPTIONAL w/ system purchase

14" Mono Monitor & Card	$95
Super VGA Monitor (1024x768 0.39) w/SVGA Card 512K	$225
Super VGA Monitor (1024x768 0.28) w/SVGA Card 512K	$250
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- 101 Keyboard

586 Pentium 66MHz VESA/PCI $1250

- 1MB Expandable to 128MB
- 256K Cache
- 3 VESA Local Bus or 3 PCI Slots
- 1.2 or 1.44 MB Floppy Drive
- 1:1 Interactive HD/FD Controller
- Tower or Desktop Case w/Power Supply
- 101 Keyboard

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NEC 3Xi Triple Speed $345

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Sound Blaster 16	$95
Sound Blaster 16 SCSI-2	$170
Spectrum 16 Bit SCSI Sound Card	$110

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- 1.1 Interleave HD/FD Controller
- Tower or Desktop Case w/power supply
- 101 Enhanced Keyboard

486SLC2-50MHz VESA w/64K Cache	$360
486SLC2-66MHz VESA w/64K Cache	$385

486DX-40MHz w/128K Cache

w/AMD 486-40MHz CPU	$425
w/Cyrix CPU, Math Chip	$315

- 1MB RAM Expandable to 32MB
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop Case
- 101 Enhanced Keyboard

$245
386-40MHz w/128K Cache

- 1MB expandable to 32MB on Board
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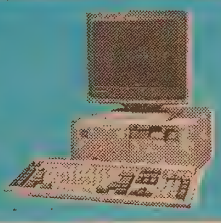
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Socket for 80387
- Tower or Desktop Case w/power supply
- 101 Enhanced Keyboard

$220
386SX-33MHz

- 1MB expandable to 16MB on Board
- Shadow RAM
- 1.2 or 1.44MB Floppy Drive
- 1:1 Interleave HD/FD Controller
- Tower or Desktop Case w/power supply
- 101 Enhanced Keyboard

170MB	$175	340MB	$245
212MB	$190	420MB	$265
250MB	$210	540MB	$340



Keyboards

Mitsumi 101 Key	$29
Keytronic 101 Key	35
Maxiswitch 101 Key	35

Floppy Drives

TEAC/Epson 1.2MB	$55
TEAC/Epson 1.44MB 3.5"	45

Hard Disks

170MB	$185
212MB	200
250MB	220
340MB	260
420MB	275
540MB	355
Fujitsu 1.2GB SCSI II 8.5 MB	730

Modems

2400 Baud (Ext)	$50
Fax Modem (9600 Fax, 2400 Modem)	40
14,400 Modem, 14,400 Fax	90

Interface Cards

Mono Graphic Card	$15
VGA Card (16 Bit 800x600)	30
OAK SVGA (1024x768 512K)	40
Trident VGA w/ 1MB RAM	60
Orchid Fahrenheit (1280x1024) w/1MB VRAM	130
Orchid Fahrenheit VLB w/1MB	140
Orchid Celsius w/1MB/2M	140/190
ATI Ultra Pro VLB 2MB	275
Diamond SpeedStar 24X	85
Diamond SpeedStar Pro VLB	105
Diamond Stealth 24 VLB	145
Diamond Stealth Pro 1M/2M	230/280
Diamond Viper w/2MB	320
AT M I/O (2S, 1P, 1G)	15
IDE Card w/cable	15
Promise IDE VESA Cache Controller	110
Future Domain SCSI Card	75
Adaptec SCSI 1542C	175
Adaptec 2742 EISA SCSI	290
Adaptec 2842 VESA SCSI	270

Monitors

14" Flat Screen	$95
Super VGA (1024x768) .39	190
Super VGA (1024x768) .28	215
Non-Interlaced SVGA Monitor	225
Impression 5 15" Monitor	335
Viewsonic 6	285
Viewsonic 14E	315
Viewsonic 15E	385
Viewsonic 15	435
Viewsonic 17G	800
Viewsonic 17	950
Mag 17" OEM 1280x1024 .26	685
NEC 3V	475
Nanao 550i-w	1050

Motherboards

386SX-33MHz	$75
386-40MHz 128K Cache	105
486SX-25MHz w/Intel CPU 128K Cache	155
486SX-33MHz w/Intel CPU 128K Cache	185
486DX-33MHz w/Intel CPU 128K Cache	325
486DX-50MHz w/Intel CPU 128K Cache	450
486DX2-66MHz w/Intel CPU 128K Cache	450
IBM 486SLC2-50MHz	170
IBM 486SLC2-50MHz VESA	240
IBM 486SLC2-66MHz VESA	250

Miscellaneous

387SX	$40
387-25/33/40	40
150W (XT) Power Supply	40
230W Power Supply	48
Logitech Mouse Man	50
Logi Trackman	75
Microsoft Serial/Bus	30/55
DFI Mouse (3 Button, Microsoft Comp.)	15
Mini Vertical Case w/PS	55
Mid Mini Vertical Case w/PS	75
Full Vertical Case w/PS	95
Colorado 120MB Tape Backup	99
Colorado 250MB Tape Backup	165
Connor 250MB Tape	155
Colorado Tracker 250MB	335
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WD SMC Elite Ethernet 16 Bit	125
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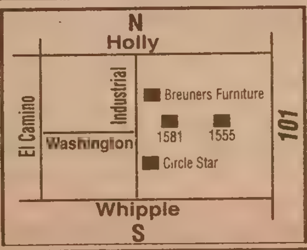

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Pentium P5-90/256K PCI	$1354	$1600(*)
Pentium P5-90/256K VLB	$1203	$1524(*)
Pentium P5-75/256K VLB	$1137	$1379(*)
Pentium P5-66/256K PCI	$1080	$1322(*)
Pentium P5-60/256K PCI	$1007	$1249(*)
Pentium P5-66/512K VLB	$956	$1197(*)
Pentium P5-60/512K VLB	$883	$1124(*)
486DX4-100/256K VLB	$815	$1057 (*)
486DX2-66/256K PCI	$532	$775(*)
486DX-33/256K PCI	$414	$659(*)
486DX2-66/128K ISA/VLB Intel	$424	$556
486DX-50/128K ISA/VLB Intel	$434	$566
486DX-33/128K ISA/VLB Intel	$304	$437
486DX2-66/128K ISA/VLB-AMD	$377	$510
486DX-40/128K ISA/VLB -AMD	$271	$404
486BL-75/256 IBM VLB w/Math-Co	$400	$642 (*)
486SLC2-66/64K IBM VLB w/Math-Co	$234	$367
486DX2-66/256K Genoa VLB	$461	$592
486DX-40/256K Genoa VLB	$308	$440
486DX-33/256K Genoa VLB	$341	$474
486DX2-66/256K NICE EISA VESA	$578	$711
486DX-40/256K NICE EISA VESA	$425	$558
486DX-33/256K NICE EISA VESA	$456	$591
486SX-25C VLB	$130	$263
386DX-40/128K ISA	$84	$217

SPECIAL BASIC SYSTEM

- * Motherboard w/CPU+4MB RAM 70ns
- * 1.2 and 1.44MB FDD
- * IDE 2FD/2HD Controller w/ I/O 2S/1P/1G
- * 120MB Hard Drive
- * 1024x768 .28DP 14" SVGA Monitor
- * 512K SVGA Card
- * 101 Enhanced Keyboard
- * Enhanced Case w/230 Watt Power Supply
- * Microsoft Compatible Mouse+ Mouse Pad

Pentium P5-90/256K PCI	$2047
Pentium P5-90/256K VLB	1970
Pentium P5-75/256K VLB	1825
Pentium P5-66/256K PCI	1785
Pentium P5-60/256K PCI	1696
Pentium P5-66/512K VLB	1645
Pentium P5-60/512K VLB	1571
486DX4-100/256K VLB	1506
486DX2-66/256K PCI	1231
486DX-33/256K PCI	1113
486 DX2-66/128K ISA/VLB Intel	1118
486 DX-50/128K ISA/VLB Intel	1128
486 DX-33/128K ISA/VLB Intel	1000
486 DX2-66/128K ISA/VLB AMD	1072
486 DX-40/128K ISA/VLB AMD	967
486 BL-75/256K IBM VLB w/Math-Co	1095
486 SLC2-66/64K IBM VLB w/Math-Co	931
486 DX2-66/256K Genoa VLB	1155
486 DX-40/256K Genoa VLB	1004
486 DX-33/256K Genoa VLB	1037
486 DX2-66/256K NICE EISA VESA	1271
486 DX-40/256K NICE EISA VESA	1120
486 DX-33/256K NICE EISA VESA	1153
486 SX-25C VLB	828
386 40/128K ISA	782

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+8MB RAM + 1.2&1.4 FD
+250MB HD
+SPiDER VLB w/1MB
+Non-Int 14"SVGA monitor
+IDE VLB+mini case
+101Enhanced keyboard
+ Microsoft Mouse+Pad

$1673

OPTIONS

	ADD
Non-int Monitor	[illegible]
Viewsonic 6E Monitor	[illegible]
DIDO 15" Non-Int	110
SPiDER BlackWidow 1M	150
SPiDER 32VLB w/1MB	50
Trident 1MB	20
250MB Hard Drive	[illegible]
340MB Hard Drive	60
540MB Hard Drive	210
IDE VESA Localbus	10
Medium case	25
Full Tower	[illegible]
Logitech Mouse	[illegible]
Microsoft mouse	[illegible]

BASIC SYSTEM includes: Motherboard &CPU, 1MB RAM, 1:1 2HD/2FD controller, w/1P/2S/1G, 1.2 or 1.44MB FD, enhanced case w/Power supply, 101 Keyboard.

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130mb/15ms (IDE)	170
170mb(IDE)	180
260mb(IDE) Seagate	220
280mb/14ms(IDE) IBM	220
340mb/13ms(IDE) Conner	240
340mb (IDE) IBM	239
420mb/12ms (IDE) Conner	250
540mb/12ms (IDE) Maxtor	345
540mb (IDE) Conner	315
540mb/11ms (SCSI) Quantum	330
1.0 GB -10ms (SCSI) Fujitsu	695
1.0 GB - 13ms (SCCI) Quantum	690

VIDEO CARDS

Trident VGA-512/1MB (1024x768,16bit)	$38/58
Diamond SpeedStar Pro ISA w/1MB	105
Diamond SpeedStar Pro VLB w/1MB	105
Diamond Stealth 24VESA Local bus w/1MB	145
Diamond Stealth 32 VLB w/2MB DRAM	225
Diamond Stealth Pro VRAM w/1MB/2MB	227/298
Diamond Viper VESA Localbus w/2MB	329
Diamond Viper PCI w/2MB	329
Diamond Stealth PCI	299
SPiDER 32VESA Local Bus w/1MB/2MB	90/140
SPiDER 32VLB Plus w/1MB/2MB	95/145
SPiDER BlackWidow VLB w/1MB/2MB	137/190
SPiDER BlackWidow Engine ISA 1M/2M	137/190
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SPiDER 256 Cache VLB w/1MB/2MB	130/165
SPiDER 64 VLB/PCI w/2MB/4MB	185/290
Orchid Farenheit ISA1280Plus w/1MB	125
Orchid Farenheit Localbus w/1MB	140
Orchid Kelvin VLB/PCI w/1MB/2MB	165/275
ATI Graphic Ultra Pro ISA w/1MB/2MB	140/190
ATI Graphic Ultra Pro VLB w/2MB VRAM/DRAM	250/190
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ATI Graphic PCI w/2MB VRAM/DRAM	265/190
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Creative Lab SoundBlaster Pro 16 MCD	150
Creative Lab SoundBlaster Pro 16 MCD ASP	175
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Creative Lab SoundBlaster 16 SCSI-II ASP	210
MEDIAVISION ProAudio Spectrum 16 OEM	115
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NEC triple speed 450KB OEM/Orig.(190ms)	370/470
TOSHIBA CD ROM 3401 (200ms) Internal	290
TOSHIBA CD ROM 3401 (200ms) External	380
Plextor CD ROM DM 3028 Internal	265
Plextor CD ROM External	365
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Panasonic single speed	
CDROM+SoundBlaster Pro + 5 CDTitles	220
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Panasonic double speed CDROM	
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Zoltrix Fax Modem (9600 F, 2400 M)/Win	40
Zoltrix Fax Modem (14400 F, 14400 M)	93
US Robotics Fax/Modem 14,400	120
Microsoft compatible 3-Button mouse	10
Microsoft mouse serial/bus	33/55
Logitech Mouseman serial(4000dpi)	33
Logitech Mouseman Bus(4000dpi)	55
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Colorado Tape backup DJ-20 250MB	158
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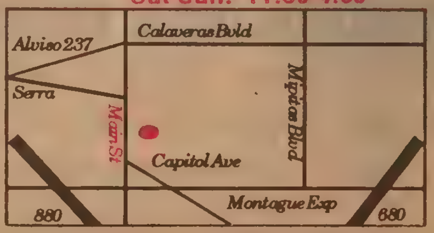

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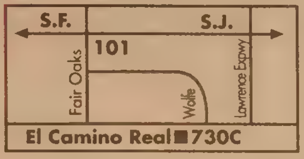

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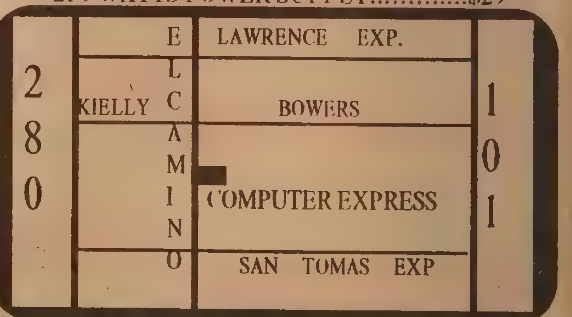

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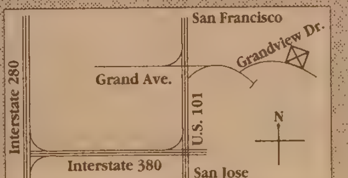

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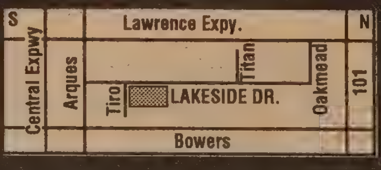

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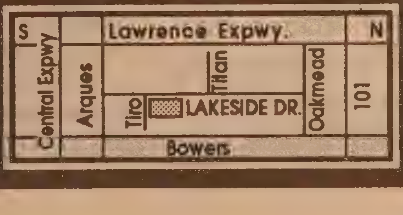

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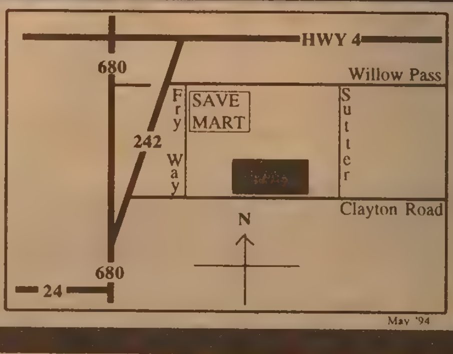

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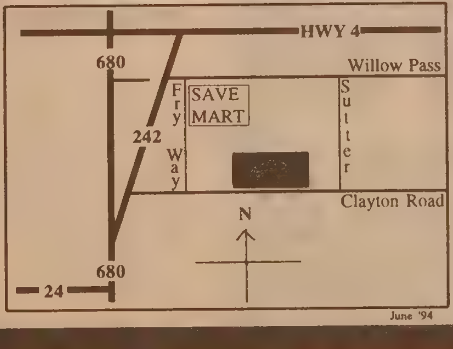

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Video Power (Mws)	56	56	56	56	56	_
Operating System	MS Windows NT	MS Windows NT	MS Windows NT	MS Windows NT	MS Windows NT	MS Windows NT
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POWER SUPPLIES

PS2 200/230/300W	$34/40/51
PS2 200W GREEN PC	$44
Full Tower 230/300/400W	$49/63/126

MASS STORAGE PRODUCTS

FlOPPY DRIVES

YE Data 1.2/1.44MB	$45/39
Teac 1.2/1.44MB	$47/42
Teac Dual Floppy 1.2 + 1.44 MB	$116
Teac 2.88 MB	$89
Toshiba 2.88MB	$58
(w/contl & 2.88 floppy disk)	$94

FLOPTICALS

IOMEGA 21MB w/1 Disk, Cable	$419
YE-DATA 21MB w/5 Disks	$392

HARD DRIVES

2.5" NOTEBOOK DRIVES

QUN 127 /256MB 16msec	$225/339

IDE

(Hard drive prices change often-please call)

Dae Young 120 MB (when available)	$154
SEAGATE 130MB IDE(WHEN AVAILABLE)	$170
CON/QTM 170MB 17 msec	$189
CON 210 14msec	$195
WD 212 12msec	$197
ST 214/260MB	$195/219
CON/WD250MB 14msec	$219
QTM 270/MXT 245MB 15ms.	$225/218
WD 340/MXT 340MB 12/14 ms	$255
CON/QTM 340MB	$254
CON 425MB	$257
WD 425MB 13msec	$270
QTM 540MB 11msec	$359
MXTR/WD 540 12msec	$347/376
CON 540MB 12msec	$342
MICROPOLIS 1/1.8GB 10ms	$759/965

SCSI - 3.5"

QTM 42MB SCSI	$69
CON/QTM 170MB 17msec	$189
CON 212MB 12 msec	$280
MXT 245/QUN 240MB Fast	$249/239
MXT 340MB 15 msec	$349
CON 340MB 13msec	$322
QUN 540MB FAST	$389
MXT 540MB/CON 540 8/12 ms	$423/434
FUJ 1.2GB 10msec 5 year	$719
DEC 1.07GB DSP3107 9ms	$757
DEC 1.6GB DSP3160 9ms	$986
MICROPOLIS 1/1.8GB 10ms	$759/965
HP1.2GB 10.5msec	$779
ST1.2GB ST31200N 9 msec.,1"high	$752
ST12400N ST2.1GB 9MS	$1439
DEC 2.1GB DSP3210 9ms	$1259

SCSI - 5.25"

DEC 3.0GB DSP5300	$2046
DEC 3.5GB DSP 5350	$2312
DEC 4.0GB DSP 5400	$2488

SUPER HARD DRIVES

Seagate Barracuda 3.5" HH (8 msec avg. seek, 4.17 msec lat., 7200 RPM)	
ST11950N/ST12550N 1.7/2.5 GB	$1535/1787

FLASH CARD HARD DRIVE

ST 75A 1.8" 5.2MB IDE<1.5MS	$484
ST 710/720A 1.8" 10.4/20.9MB	$888/1177
ST 740A 1.8" 41.9MB IDE<1.5ms	$2068

EXTERNAL HRD. DRV. SUBSYSTEM

FOR EXT. HARD DRIVE,........... ADD $99

TAPE DRIVES

(<500MB TAPE-BACKUPs)

Colorado 120 / 250MB	$99/139
Colorado KE-10 External kit with card	$105
Colorado External port card	$37
FC-10 high perf card	$85
Colorado Trakker 250MB	$329
Archive 250MB w/QIC, 150MB/min, 1"H	$146
Archive Viper 250MB hh SCSI I/E	$335/425

(>500MB for PC / SERVER)

Viper 525MB hh SCSI Int/Ext 6MB/sec	$440/530
Mountain 2/4GB Filesafe Int Dat 4mm	$1629/1959
Archive 4320 NT 2.0GB DAT 3.5"	$829
Archive 4324NT 4.0GB TURBO DAT 3.5"	$1075
Colorado 2.4 / 4.0 GB Qic 5.25	$929/1155
HP 2GB DAT 4mm Int/Ext	$920/980
HP 4-8GB DAT 4mm Int/Ext	$1080/1150
WANGDAT 3100 2.0GB 4mm Int/Ext	$902/1020
WANGDAT 3200 4-8GB 4mm Int/Ext	$924/1035
EXABYTE 750MB HH MINI Int/Ext	$692/860
EXABYTE 8205 5GB HH Int/Ext	$1595/1695
EXABYTE 8505 10GB HH Int/Ext	$2339/2505

(above drives require special contr & soft drivers)

TAPE BACKUP DRIVERS

Novaback for DOS//OS/2	$65
Novanet Multiuser NLM	$279
ARC Serve Solo	$175
SYTOS for DOS/NOVELL, GEN	$120
Conner Backup Exec for Dos/Win v3.3	$79
Conner Backup Exec for Netware v3.1	$259

MAG/OPTICAL (Rewritable)

TEAC 128MB 3.5" Int/Ext	$625/729
PinnacleTahoe 130 portable 3.5"Opti w/Inter	$999
IBM 127MB 3.5" Int/Ext	$833/943
Panasonic LF-7010 1GB 5.25	$2799
HP 1.3GB 5.25" SCSI-2 EXT	$2799
MAXOPTIC 1GB Tahiti IIM 35msec	$2260

REMOVABLE DRIVES

Syquest 44MB Dr.	$249
......W/Ext Case, Cables, Cart, Cont	$379
Syquest 88/105MB Dr.	$308/389
Bernoulli 44/99 Insider	$907/840
IDE: Upto 1GB removable kits	$39
SCSI: Upto 1GB Removable Kits	$138

DISKETTES & CARTRIDGES

Floppy Bulk 20+/100+/500+	$.47/.44/.39
Floppy 1.2/1.44 Bulk	$.44/.49
Tape DC2120 250MB..Formatted	$16
Tape DC 6250 5.25", 1/4" Cartridge	$25
Tape DC 6525 5.25", 1/4" Cartridge	$30
TK50 for DECs	$24
DAT 4mm 90 mtr HP/OEM	$20/14
DAT 8mm 112 mtr.	$14
Syquest 44/88/105MB Cart	$62/94/85
Bernoulli 44MB/90MB 3Pk	$289/298/264
Mag-Opt 600MB/650MB 5.25" Rewrite	$86/86
Mag-Opt 1.2/1.3 GB Rewrite	$124/124
Mag-Opt 600/650MB WriteOnce	$86/86
Mag-Opt 1.2/1.3GB WriteOnce	$128/128
Mag-Opt 128MB 3.5"	$58
Mag-Opt 650/1.3GB WORM 5.25"	$160/193

VIDEO ADAPTERS & MONITORS

ISA/EISA ADAPTERS

MGP	$13
VGA 256k	$28
Trident 512K/1MB	$39/58
Tseng 1MB	$73
Mustang 1MB Window Accel	$58
Diamond Stealth 24	$137
Diamond Stealth Pro 1/2MB	$249/$339
Orchid Fahrenheit 1MB	$143
Hercules Dynamite Pro 1/2MB	165/210
Hercules Graphite Pro 1/2MB	$274/418
ATI Ultra Grpx 1MB w/Mouse	$214
ATI Ultra 8514 1 MB VRAM(Dual mon. cap.)	$176
ATI Ultra Pro 2MB (no mouse port)	$294
Genoa 7900 w/1MB	$95**
Genoa 8560 w/ 1MB	$171**
Genoa 6200	$36**
ATI Ultra Pro EISA 2MB	$316
AMI Fast View EISA VGA Graphics w/1MB	$221

VLB/PCI ADAPTERS

(wm = winmark ver2.5)

MustangVT Trident 1/2MB	$69/114
MustangVC Cirrus logic 5428 1/2MB	$79/126
MustangVS S3-805 1/2MB	$89/134
Spider 32 1MB/2MB,20 WM	$95/139
Spider 32 Plus 1MB	$98
Spider Blk Widow 1/2MB 54 WM	$134/197
DIAMOND Stealth 24vlb 1MB	$139
DIAMOND Stealth pro 1/2MB vram,36wm	$255/316
DIAMOND Viper 2MB,9000,50wm	$322
ORCHID Fahrenheit S3-805,1/2MB	$135/193
ORCHID Celsius 1/2MB	$216/266
ORCHID Kelvin 1/2MB	$149/194
Hercules Dynamite Pro 1/2MB	172/225
Hercules Graphite Pro 1/2MB	$274/418
ATI Ultra Pro 1MB DRAM	$137
ATI Ultra Pro 2MB, 26wm	$325
Cirrus Logic 5428 PCI 1/2MB	**$126/171**
Orchid Kelvin PCI 1/2MB	**$149/194**
Spider 64 PCI 1/4MB	**$193/311**
ATI VRAM 2MB PCI	**$249**
DIAMOND VIPER 2MB PCI	**$338**

CAD SPECIALITY ADAPTERS

NUMBER NINE - #9GXI/GXE

L10 ISA or VLB Retail/Bulk	$249/236
L11 ISA or VLB Retail/Bulk	$359/339
L12 ISA&VLB Retail/Bulk	$420/406
L14 ISA&VLB Retail/Bulk	$649/599
L20/21 lite	$515/679
L23 WIND/ACAD,T34020,1280,16C	$955
L29 T34020,1024X768X16.7M Color	$1359

MATROX

MGA-VLB 2/Plus	$429/479
MGA-VLB 4/200	$865
MGA-IMP 3A&V	$715
MGA-PRO 4.5V/4.5+z buffer	$1119/1399
MB memory upgrade	$209
MGA-PCI 2/2Plus	**$385/429**
MGA-PCI 4/4-200	**$744/968**

METHEUS CORPORATION

Premier 928 VL2(1MB)/4(2MB)	$324/559
Premier 928-ISA 1M/2M/4M	$297/422/725
MODULE 1MB Memory	$119
1104 Plus 256 Hz, MultiDisplay	$1295

(We do not have the high end CAD adapters and monitors on display and carry only a few in stock - these are on Just-In-Time inventory basis - please place orders in advance-the prices in parenthesis are on a cash basis only)

9" - 14" MONITORS

MONO

Mono 14" amber/white	$79
Mono 9" VGA/14" SVGA	$104/91

VGA/SVGA

VGA IBM 8513 13" .28 refurb 6 mon	$154
SVGA 14" 1024 x 768 .39	$189
SVGA 14" 1024 x 768 .28 Int.	$216
SVGA 14" 1024 x 768 .28 NI	$229
Black SVGA 1024 x .28 I/NI	$270/282
Kanaka 14" Int/NI w/Hitachi Tube	$233/256
CTX 14" 1024 x 768 .28 Int.	$247
CTX 14" 1024 x 768 .28 NI	$260

CAD MONITORS

Miscellaneous

KANAKA 15" Hitachi Tube 1280 x 1024 .28	$329
Sony 1604s OEM	($835)$870
KFC 15/17"1280NI .28/.26	$349/$739
Mitac 17" .28 1280x NI	$655
Mitac 17" .26 1600x NI Energy* 3yr warnty	$729
Mitsubishi 15FS/17FS DiamScan	$498/1039
MAGNVX20CM64 20", 1280, .31.	($1110) $1150

NANAO

F550i 17", .28,1024NI MPR2	($888)$933
F550iw17",.281280NI MPR2	($968) $1017
T560i 17",.25 1280NI, MPR2	($1482) $1556
T560iw,.26 1280NI,MPR2 Promo	($1241)$1305
T660i 20",.30 1280NI MPR2	($2224) $2336
F760iw21".31,1280NI,MPR2	($1975) $2073

NSA-Hitachi

CM1797 17".28.1280NI,MPRII	($1050)$1099
CM2095 20" 1280 Anti Glare	($1259) $1320
CM2087 20" 1280 72Hz Mic	($1519) $1576
CM2187-515 21" .28 1280NI	($1929) $1995
CM 2188 21" .28 1280NI	($2230)$2289

Hitachi America - ACCUVUE

PS-20,.31dpi 1600x NI	($1555)$1618
PS-21,.28dpi 1600xNI	($2041) $2122
PS-21A,.28dpi 1600xNI	($2295)$2389
PS-21.28dpi 1600xNI Mic	($2354) $2449

Sony

CPD1430s 14" 1024NI .25	($539)$555
CPD1730 OEM 1024NI .25	($828)$859
CPD 1730 Original 1024NI,.25	($970)$998
GDM17SE 17" 1600NI .25	($1109)$1144
GDM2036S 20", .1280NI,.30	($1879) $929
GDM2038 20',1280NI,.30	($1989) $2059

Nokia

17" 447B Trin.25dpi,1280x	($927)$975
21"445M.26,1280NI	($1978)$2029
21"445X.26,1600NI	($2566)$2615

Sampo

Sampo KDM1767 17" .28	($675)$719
Sampo 1777 17" .28 Microp	($755)$795
Sampo 2055 20" .31	($1040)$1075
Sampo KDM2077 20" NI 1280 .31	($1460)$1520

NEC

CDR-400/500	$415/$465
CDR-600/900	$495/$965
3V/4FGE	$495/($635)$666
5FGE/FGP17".28,	($1007) $1049/($1125) $1165
6FGP21",.28,1280NI	($2055)$2125

MAG

LX1564 OEM 15" .28, 1280NI	$399
MX15F 15"MPR II	($459) $477
DX 17F 17" .26 1280x	($725)765
MX17F,17".26,1280NI,Mic Org	($865) $898
MX17FG,17".26,1280NI,	($875)$915

CASH COUPONS

MONITORS
MITAC 17"
.26 1600 NI
ENERGYSTAR
3 YEAR WARNTY
$685

MONITORS
KANAKA
15" .28 1280
$315

COMMUNICATIONS
2400MODEM..$24
96/24 F/M.........$39
14.4 INT F/M.......$84

COMMUNICATIONS
US ROBOTICS
14.4 F/M INT
5 YEAR/16550 UART
$109

MOTHERBOARDS
486 DX VLB W/256K
DX-33 CYRIX...$249
66 AMD/INTEL..$419/459
100DX-4 INTEL.....$825

MOTHERBOARDS
PENTIUM
Capricorn series
60 Mhz PCI..$999
66 Mhz PCI/EISA.$1,215
90 Mhz PCI........$1,479

ADAPTERS
CONTROLLERS
IO W/16550...$29
SCSI w/DRIVERS.....$49
ADAPTEC VLB SCSI..$289
ADAPTEC PCI SCSI...$279

ADAPTERS
GRAPHICS VLB
CL 5428 1MB........$79
ORCHID KELVIN.......$144
HERCULES DYNA 1MB....$159
DIAMOND VIPER 2MB....$329

MICROMARKETPLACE

MULTI MEDIA

CD-ROMs

IDE TYPE CD-ROMs

CD-ROM-#1-of-the-Month

Mitsumi Kit 350msec, 150 KB/S........**$95**

Panasonic 562 DblSpd.320ms, 300kb/sec	$148
Mitsumi Dbl-Spd 250ms,300kb/sec	$146

Super Multi-Media Complete Kit on Sale!
Mitsumi CD-ROM, 150KB/sec, 350ms
8 bit Sound Blaster Compatible Card (for Win)
Quickshot Warrior joystick
Shielded PC spealers
Deluxe model microphone
Award winning Apogee sound-supported
games; all for................**$153!!!**

SCSI CD-ROMs

NEC 3X 510CDR Ext 195ms,450KB/sec	$440
NEC 3XP Portable 250ms,450KB/sec	$460

CD-ROM-#2-of-the-Month

NEC 3X CDR-510 Multispin, 195ms,450KB/sec
......**$339**

TOSHIBA 3401B/E 200ms, 300kb/s I/E.	$293/377
TOSHIBA 4101 B/E 235ms,300Kb/sec Int	$223
Texel 3028/5028 240ms, 335kb/s I/E	$265/349
SONY CDV561, 295ms, 300kb/sec	$286
Future Domain SCSI CD-ROM Kit	$69

AUDIO CARDS & MPC KITS

Hyena Snd Blster Comp. 8bit Sound Card	$39
Hyena w/ Speaker, Joystck, mcrphn, games	$53

MEDIA VISION

Pro Audio 16 Basic	$91
Pro Audio Spectrum 16 ORG	$95
Pro Audio Studio 16/Power Pack	$199/69
Fusion Double CD16 Kit Int/Ext	$475/495
Pro 16 Multi-Media System/II	$609/764
Pro Movie Spectrum/Studio II	$279/309

CREATIVE LABS

Sound Blaster Deluxe 8bit	$67
Discovery 8/16 Upgd. Kit	$369/429
Edutainment 8/16 Upgd. Kit	439/489
SoundBlaster 16 Basic/SCSI 2	$102/171
SoundBlaster 16 ASP SCSI/MCD	$204/173
Sound Blaster Voice Editor	$55
Wave/Video Blaster	$179/305

MISC MULTI-MEDIA PRODUCTS

Encyl 1:Encyl,Animals,World/US Atlas	$55
Educational 1 plus Family health	$72
Joystick	$15
Mouse Systems Joystick	$25
Logitech Fotoman Digital Camera for PC	$465
Logitech SoundMan 16	$109
Intel Smart Video Recorder	$520
Cardinal Tech Digtl Sound Pro 16/Plu	$145/186
Video Logic Captivator Kit win3.1	$369
Midi Mate/CDPC XL	$49/1059

PLOTTERS, DIGITIZERS, SCANNERS & PRINTERS

PLOTTERS

HOUSTON INSTRUMENTS

V50 INKJET A-C,2MB BUFFER	$1298
HiPlot 7100 A-D 8 pen,LCD display	$2575
HiPlot 7200 A-E 8 pen,LCD display	$3395
DMP-162R A-E, 8 Pen, Roll Feed	$3958

DIGITIZERS

SUMMAGRAPHICS

III 12x12 w/16btn or 4bt & Pen	$313
III 12x18 w/16btn or 4bt & Pen	$539

KURTA

XLP 12x12 w/4btn & Pen	$225
XLP 12x18 w/16btn or 4btn & Pen	$429
XGT 12x12 w/4Btn	$322
XLC 36x48 w/16btn or 4btn&pen	$1520

CALCOMP

CALCOMP 12 X 12/12 x 18	$299/629
CALCOMP 18 X 24	$1275

SCANNERS

LOGITECH (HAND-HELD)

SCANMAN-COLOR/w OmniPage	$392
SCANMAN 256GS wo/ w OmniPage	$155/195
SCANMAN 32GS w/ OmniPage	$128
Power Page Slide	$479

MICROTEK

SCANMAKER II/IIXE 600dpi w/OCR	$659/915
Scan-in-Dex Business card scanner	$275
Scanmaker IIG/IISP	$495/815

MUSTEK (Hand-held)

ScanMagic256,400dpiw/perceive	$109
ScanMagic Color,400dpi,256 grays w/perc	$215
GrayArtist,800dpi,256 grays w/perc	$159
Colorartist Pro,800dpi,256&colr w/per	$315

MUSTEK (Flatbed)

Paragon 600(dpi)24 bitclr,Photoshop	$629
Paragon1200(dpi)24 bitclr,Photoshop	$998

UMAX Technologies

UC 630 PC,1200dpi max,24bit /256gray	$719
UC840,1600dpi max,16.8 million clrs	$949
UC1260,2400dpi max,16.8 million clrs	$1225
UC1200SE,2400dpi max.,30 bitclrs	$2634

Hewlett Packard

HP IIP Grayscale scanner	$515
HP IICX Color scanner	$998

EPSON

ActionScning 300/ES 800C	$839/1329

Miscellaneous

Mouse Systems Gray/Color hand held	$175/125
Info 3gs 300dpi sheet fed	$375
Info SF-6C 600dpi sheet fed	$450
LeoScan 610 sheet feed,300dpi/256 gray	$599
Westbrook File Majic OCR for scanners	$285
Relysis 9600 800dpi color flatbed	$2995
Tamarack 6000/8000C	$729/853
Fujitsu M3096 11.7x17"	$4500

PRINTERS

Miscellaneous

Star Micrnix NX1001 9 Pin.120/220V	$134/144
Star Micronix 220v quantity of 100 only	$135
IGOR 132 9Pin Wide **220V** (Cyri..).in stock ......with any purchase	$110

EPSON

Action 2250 9 pin,50sheet,240cps	$133
LQ 1070+ 24 pin Wide,252cps,11fts	$379
LQ 1170 9/24Pin,2 resident fonts	$399/619
Stylus 300 Inkjet 360dpi,150cps	$241
Stylus 800 Inkjet 360dpi,150cps,100sht	$289
ActionLaser 1500 300dpi,6ppm,1mb	$675

CANON

BJ 200e/230,360dpi,49k,7fnts,4ppm	$295/395
10SX,110cps,360dpi,**Portable**	$245
BJC 600 Color,240cps,360dpi,100shtfd	$580
BJC 820 Color,240cps,4ppm,1MB	$1496

OKIDATA

OL 380 dotmatrix,24Pin,23K	$217
OL400e/410elaser 4ppm, 300dpi	$499/645
OL810, 8ppm, 300dpi	$885
OL830 Plus, 8ppm w/ 2MB post script	$1189
OKI ML320 320cps 9pin/ML 520	$315/365
OKI ML590/591 24 pin..auto form	$419/563

PANASONIC

KX-P2124, N-Carr, 320cps, 360dpi, 12fnts	$318
KX-P2624	$389
KX-P1624, W-Carr, 192cps, 360dpi, 14fnts	$383
KX-P4410,5ppm,300dpi,28fnts,512k	$529
KX-P4450ii	$987
OKI ML 850 300dpi,2MB	$1169

CITIZEN

GSX 145 24Pin wide,160cps,360dpi	$349
GSX200 9pin,Narr/wide	$168/290
GSX220 24pin/CTZ projectII 3ppm	$179/279
GSX230 24 pin.8 fonts, 270cps	$221
(color option for Citizen 80 col printers	*$45)*
GSX240 24 pin 300cps, 13 fonts	$281
Notebook Pr. CTZPN48/P-IBM	$284/326

HEWLETT PACKARD

Deskjet 520 300dpi,120cps,16k	$289
Deskjet 500C Color 300dpi,167cps 16k	$385
Deskjet 560C Color,3ppm,300dpi,80k	$557
Deskjet 1200C/ps Color2MB	$1375/2099
HP 4/4P/4SI/4L	$1345/939/2855/637
4M/4ML/4MP/4 SMIX	$1865/974/1350/4210

NEC

Pinwriter3300 24pin wide,360dpi,80K	$326
Pinwriter6200 24pin narrow,360dpi,80k	$415
Pinwriter9300 24pin wide.360dpi 333draft	$839
Silentwriter superscript610,6ppm,256k	$479
Silentwriter1097 600dpi,7mb	$1375

FUJITSU

10/10W Laser,10ppm,1/2mb 14/35fts	$830/942

All printers are on a cash basis only and come with the Original manufacturer's warranty, please call for lead time. No returns on any printer purchase with this pricing.

MEMORIES, MATH-COs & CPUs

MEMORIES for IBMs

SIMMs

256 x 9 (3 chip)-70NS	$13
1M x 9 (3 chip)-70 Major brand	$40
1M x 9 (3 chip)-70NS IBM original	$38
1Mx9(2 chip)-70NS No parity	$36
1M x 9 (9 chip)-70NSMajor brand	$42
4M x 9 (3 chip)-70NS	$148
4M x 9 (9 chip)-70NS	$159
1M x 9 (3 chip)-60 Major brand	$42
4M x 9 (9 chip)-60NS	$161

ESIMMs(72 Pin)

256x36-70NS	$55
512x36-70NS	$95
1x36-70NS	$155
2x36-70NS	$320
4x36-70NS	$649
1x36-60NS	$158
2x36-60NS	$335
4x36-60NS	$660

SIPPS

256x9 (3 chip)-70NS	$14
1x9 (3 chip)-70NS	$43
1x9 (3 chip)-60NS	$46

DRAMs

1x1-70/80NS	$5.50/5.25
256x1-70/80NS	$1.75/1.60
256x4-70/60NS	$5.75/5.50

MEMORIES for MACs

MACINTOSH

1x2chip-70/80NS	$35/33
1x8chip 70/80NS	$40/37
2x8chip 70/80	$85/80
4x8chip-60/70/80NS	$137/126/125
16x8chip-70NS	CALL

APPLE UPGRADES

Centras & Quadra 600 series

256x32-70NS	$39
512x32-70NS	$78
1x32-70/80NS	$136/133
2x32-70NS	$278
4x32-70NS	$510
8x32-70NS	$1175

QUADRA 800 SERIES

512x32-60NS	$78
1x32-60NS	$137
2x32-60NS	$275
4x32-60NS	$645
8x32-60NS	$1285

CACHE RAMs

32x8-20	$6.90
64x4-20	$7.50
8x8-20	$3.70
16x4-20	$3.85
64x1-20	$6.70
128x8-25	$38
32x8-15	$7.90
64x4-15	$9.50
8x8-15	$4.10
16x4-15	$4.75
64x1-15	$8.45
128x8-25	$47

CPUs & CPU FANS

INTEL

386 DX33	$40
486 SX25/33	$75/102
486 DX 33	$253
486 DX 50	$390
486 DX2 50	$276
486 DX2 66	$375
486 DX-4 75/100	$555/716
Pentium 60MHz	$690
Pentium 66MHz	$765
Pentium 90MHz	$938

AMD

386 DX 33/40	$47/48
486 DX-33	$185
486 DX 40	$215
486 DX2 50	$244
486 DX2 66	$310

CYRIX/TI

486 DLC 33/40	$62/82
486 DX 33/40	$159/187
486 DX2-50/66	$202/307

CPU Fans

486 heat sink and fan	$7.95
Pentium heat sink and fan	$13.50

MATH-COPROCESSORS

INTEL

80387 SX 16/20/25	$45/64/75
80387 DX 16/20/25/33	$35/40/45/80

Overdrives - call for latest prices

IIT

3C87SX-16/20/25	$39
3C87SX-33	$39
3C87DX-25/33/40	$39

CYRIX

83S87SX 25	$39
83S87SX 33	$39
83D87-33	$41
83D87-40	$41

WEITEK

4167-25	$265
4167-33	$425

LASER EXT. MEMORIES

HEWLETT-PACKARD

HP IIP, IIP+,III,IIID,IIIP	1/2/3/4MB	$75/114/155195
HP II, IID	2/4MB	$124/199
HP IIISI	1/4MB	$76/204
HP IV	4/8MB	$165/365
Deskjet 500, 500C, 550C	256K	$88

PANASONIC

KXP 4410/20/30	1/2/3/4MB	$98/148/175/215
KXP 4450	1MB	$137
KXP 4455	2MB	$164

OKIDATA

OKI 400	1/2MB	$98/119
OKI 800/820	2/4MB	$123/193
OKI 810	1/2MB	$111/189

Special Terms and Conditions for this Section: CPU and Memory prices change on a daily basis; please call for the latest prices. These products when bought without systems may come with a shorter warranty - please enquire. We do not stock many of the above products - please call for availability.

SOFTWARES

For Networking, Communications, Tape Storage Drivers, Networking Drivers, Multi-Media and Speciality Softwares also look in the corresponding sections.

UTILITIES

Norton Utilities V 7.0/Anti-Virus v2.1	$116/89
QEMM 386 V7.0	$69
AfterDark V2.0 WIN	$29
PC Tools V 8.0A	$57
Auto-Doubler/Disk-Doubler	$68/61
LapLink V5.0 FOR NETWARE	$74
MickyMouse/StarTrek Screen Saver	$39

DESKTOP PUBLISHING & GRAPHICS

Corel Draw V4.0/UPGRADE	$383/218
Pagemaker/WIN V5.0	$554
Harvard Graphics For Windows	$248
Norton Desktop WIN V2.2	$115
Micrographx Graphics Works	$158

DATABASES

Accesss for Windows	$145
CA-Clipper V5.2	$512
DBASE IV V2.0	$513
FoxPro For Win/DOS 2.5 Upgrade	$300/305
FoxPro LAN	$call
Paradox V4.0/WIN	$524/145
Q & A 4.0	$243
Superbase 2.0 WIN	$345
LOTUS SMARTSUITE	$448
Gupta SQL router/SQL server	$166
Gupta SQL for DOS	$2597
Gupta SQL gateway for netware	$3252

ACCOUNTING/BUSINESS

CA-Accpac BPI Integrated	$148
CA-Acc. Simply Accounting DOS	$79
DAC Easy Accounting/Payroll 4.3	$94
Works for WIN 2.0	$129
MS Project 3.0 for WIN	$425
MS Office 4.2 (Word,Excel,Pwrpoint,Mail)	$475

SPREADSHEETS

LOTUS WORK V3.0	$99
MS Excel V5.0	$292
MS Works for WIN	$123
Quattro Pro V 5.0 WIN/DOS	$54

WORD PROCESSING AND GRAPHICS

AMI Pro 3.1	$240
Grammatik	$73
Professional Write V 2.2	$159
MS Word 6.0 for DOS/WIN	$305/299
Word Perfect 6.0 for DOS/WIN	$296/294
WordStar 7.0	$264

COMMUNICATIONS

Procomm Plus 2.01/WIN	$70 /97
WinFax Pro V 3.0 for WIN	$99
Norton PC Anywhere 4.5 Host/Rem	$65/86
CrossTalk for WIN	$129

PROGRAMMING LANGUAGES & OPERATING SYSTEMS

M.S. DOS 6.2/UPGRADE	$48
M.S. OEM Windows 3.11 for PC system	$56
M.S. Windows V 3.11 Original	$89
DESQView V1.1	$163
Windows NT 3.1 /UPGRADE	$314/278

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340/420 IDE
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MAXTOR
540 IDE/SCSI
8.5 MSEC
$363/418

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$690

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QUANTUM 2.1 GB
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$1,199

NETWORKING

16BIT NE2000 COMP COAX/TP	$37
16 BIT NE2000COMP COMBO	$39
INTEL 10BT FLASH	$99
8 PORT TP HUB W/AUI	$159
16 PORT TP HUB W/AUI	$359

MULTIMEDIA

8BIT SOUND C/KIT	$39/59
MITSUMI 1X CD ROM	$94
MITSUMI/PANASONIC 2X INT.	$139
TOSHIBA 2X 3401 INT.	$299
NEC 510-CDR 3X	$329

MICROMARKETPLACE

COMMUNICATIONS

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PONY 902Z 96/24 Fax (Send)/Mod Int.	$27
PONY 992Z 96/24 Fax/Modem	$40
PONY 992NZ 96/24 F/M, v.42 bis Enh.	$55
PONY 1414IZ 14.4 F/M,.32/.42 w/Bitfax Int.	$88
Pony 14.4 F/M .32/.42 Int w/Voice prm	$137
PONY 992PZ **Pocket** 96/24 F/M,.32/.42	$63
PONY 1414PZ **Pocket** 144 F/M, v.32, v.42	$184
PONY 992MG **PCMCIA** 96/24 F/M v. 42	$132
PONY 1414MG **PCMCIA**144/144 F/M v.42	$244

AT&T Paradyne

DataPort 14.4 Fax V.32bis External	$175
Comsphere 19.2/14.4 Fax v.42bis Ext	$575
Keep in Touch **PCMCIA** 14.4 S/R Internal	$299

US ROBOTICS

9600 Sport Mod/fax V.32 V.42bis I/E	$113/135
14,4 Sport Mod V.32bis V.42bis I/E	$115/137
14,4 Sport Mod/Fax V.32b V.42b I/E	$117/141
14,4 Mac&FAX Ext. Mod/fax	$165
14,400 HST Courier Dual V.32bis	$742
Modem Sharing Single/Dual Kit	$548/964
World Port **PCMCIA** 14.4 Mod/fax Int	$305

INTEL

14.4 Fax/Modem Winfax Int./Ext	$119/138
Satisfaction 200/300Fax Int	136/125
Satisfaction 400 14.4 S/RFax Int/Ext	$295/329
14.4 **PCMCIA** S/R Internal	$259
Net SatisFAXtion v2.5 20 User	$745
Wireless modem for lan based server	$755

HAYES

Accura 14.4 F/M .32/.42 Int/Ext	$155/165
Optima 14.4 F/M .42 Int/Ext	$372/372
Optima 14.4 F/M PCMCIA	$285
Optima 14.4 F/M Pocket	$335

ZYXEL

U-1496B 16.8/14,4 VoiceFax SW,S/R Int	$318
U-1496B+19.2/14,4 Voice Fax SW,S/R Int	$429
U-1496E 16.8/14.4 VFax SW,S/R LED Ext	$298
U-1496E+ 19.2/14.4VFaxSW,S/R LED Ext	$419
U-1496+ 19.2/14.4VFaxSW,S/R LCD Ext	$625
U-1496+19.2/14.4 S/R LCD **MAC** Ext	$639
U-1496E+ 19.2/14.4 S/R LED **MAC** Ext	$429

PRACTICAL PERIPHERALS

14.4 Fax/Modem S/R Internal	$164
14.4 Fax/Modem S/R External	$180

Miscellaneous

National Tyin 2000 96/24 Int. w/voice	$125
Complete Comm EZ 96/24 Int w/voice	$150
Supra 14.4 F/M Int/Ext	$125/135
Supra Mac 14.4 Ext	$159
Megahertz 14.4 PCMCIA Type3	$298
Motorola 14.4 Int/Ext	$

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NETWORKING PRODUCTS & SERVICES

ETHERNET Adapters

NE 2000 Plus Comp 16bit Coax/10BT	$36/38
NE2000 Plus Comp Combo soft&hard config	$41
D-Link 16 Bit,SoftConfig. 10BT 1/6 Pack	$70/377
Intel EtherExpress 16/5pk/20pk	$104/479/1815
Intel EtherExpress 16 MCA C/16 MCA TP	$171
Intel EtherExpress 32 EISA/Flash 32C	$419/239
Intel EtherExpFlas TP/C 5/20pk	$119/585/2059
SMC Ethcard 16 UltCx/6 Pk/24pk	$109/574/2149
SMCEthcard+IA for MCA/TP	$179
SMCEthcard+Elite16 Cx/TP1/6/24	$119/615/2289
3 Com 503 Etherlink II 16 Bit Coax/TP	$159/169
3 Com 507 Ethlink II 16 Bit Coax/TP	$289/299
3 Com 509 Ethlink III Coax/5Pk	$119/505
3 Com 509 Ethlink III Combo/5/20	$145/559/2199
3 Com 529/579 EISA Coax/10 BT/5pk	$229/959
EagleNE2000 Plus /5Pk	$89/385
EagleEP2000 Plus/5pk	$92/405
Asante Etherpack2000+ Coax/10 BT	$129
Microdyne NE2000 Plus	$109/94
HP Ethertwist PCLink/6pk	$159/759

ARCNET

16bIT Star/bus Topology-combo	$65
4Port Passive Hub	$15
8 Port Coax stackable Active Hub	$139

ADAPTERS for TOKEN RING

Intel Token Express 16/4 ISA/MCA	$429/469
SMC Token Ring Adapter 16/4	$345
3 Com Tokenlink III 16/4 ISA/EISA	$455/635
IBM Token Ring Adap II	$289

POCKET LAN ADAPTERS for Notebooks

Advanced LAN Net Coax/10BT	$129
XIRCOM PE3 10B2/BT/BC	$274/274/299
XIRCOM 16/4 MBNS Tokenring w/Type 1Bnc	$525
Xircom 16/4 Tokenring w/Type 3Coax	$525
DLINK DE-600 Softconfig. Coax/10BT	$172

PCMCIA ADADAPTERS for PalmTops

DLink DE-650 Coax/TP	$191/195
NATIONAL NE4100 COAX/10 BASE T	$214
XIRCOM Credit Card BNC/RJ-45	$269
XIRCOM Crdit Card Courso	$299
GVC Adapter	$137

CABLES & CONNECTORS

ETHERNET RG58 or RJ45 10BaseT

Readymade w/Connectors 10'/25'/50'	$4/6/9
RJ45 10BT patch cabnles 7'/25'	$4/6
Token Ring patch cable	$23
RG58 Bulk SPOOL	$80
RJ45 10BT 1000' level4/5	$119/130
BNC 50 Ohm Terminators/Crimp-ON/Barrel	$1.49
BNC T-Connectors	$1.99

Concentrators

CeLan 2-Port BNC/AVI Repeater	$235
Ce-Lan 4-Port BNC/AVI Repeater	$445
Allied Telesis 4-Port Repeater 2AVI,2BNC	$750
Allied Telesis,4-Port,8BNC,1AVI	$699
Allied Telesis,8 -Port,8 BNC,1AVI	$785
Allied Telesis-3008 Multi-port 8BNC,1AVI	$1189

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Hubs

CeLan 8 Port 10 BT w/BNC Cascade port	$168
CeLan16 Port 10BT w/AUI exp. port	$385
CeLan 16 Port 10BT managable	$439
CeLan 16 Port Intelligent w/SNMP	$
Allied Telesis 12 Port RJ45,1AUI	$459
Asante 8 Port Hub,8RJ45,1BNC	$249
Asante 12 Ports,12tp,1BNC Thin,1 AUI Thick	$475
Asante 1701 Smart 12Ports/SNMP	$1019
Microdyne 18 port 10 Base T5000 series	$619
D-Link 12 Port 10 BaseT	$399
D-link DE-1500 w/SNMP	$869
D-link K1032 32Port w/SNMP	$1199
Intel EE 12 Port 10 BT Hub Int w/Harmonica	$634
Intel EE 12 Port Hub Int EISA w/Harmonica	$699
SMC 8 Port Concentrator/12 Ports TP	$325/599
Synoptics 2800 A 16 Port w/AVI	$699
Synoptics 2803 16 Port w/AVI	$749
Synoptics 2804 16 Port w/Fiber Optics	$951
3 Com Link Builder 3C621 12 Port	$729
3 Com Link Builder TR 3C510180/82	$1751/3599

BRIDGES

Allied Telesis local Ethernet Bridge	$1645
3 Com 802C NetBuilder local Ethernet	$3399
3Com 750 NetBuilder Token Ring local	$4714
3Com 5823C NetBuilder Remote	$5319
Synoptics 3323S Ether Local w/AVI	$2353
Synoptics 3522 Token Ring	$5319
Novell Multiprotocol Router v 2.0	$669

PRINTER SHARING

Ethernet Print Servers

INTEL

Ethernet NetPort II for Coax,10BaseT	$385/379
Token Ring NetPort with DB9 Connector	$529
Netport ExpressXL Coax, UTP, 10BaseT	$624

(Conpact design for easy connectivity on on versions of Novell Netware. Comes with either 1S/1P or 2P ports)

OTHERS

Eagle NPE400 Parallel Port RJ-45/Coax (1P)	$364
XIRCOM Pocket Ethernet RJ45/Coax	$305/289

(Allows a Pocket LAN Adapter and a Parallel Printer to be attached to one LPT Port)

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Simple AUTO-SWITCHING

2 Computers to 1 printer Electronics	$24
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2 Computers to 1 Printer Bi-directional S/P	$49/45
4 Computers to 1 Printer Bi-directional S/P	$69/61
*Fax Swithcer 2 Port Fax/Telephone	$85

PRIMAX Advamced Printer Sharing

PrinterNET Transm/Rec. kit (w/25')	$69
PrinterNET Starter kit	$155
(It can connect 16 computers to 6 printers)	
ModularLink Transm DB-25(w/25')	$40
ModularLink Receiver Cen	$45
ModularLink Starter Kit	$106
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COMING SOON... PRIMA NET STARTER KIT & TRANSMITTER/RECEIVER KIT WITH 25' CABLE

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Ver 3.12 5/10/25/50 User	$604/1375/2019/2579
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Ver4.01 5/10 User	$815/1739
Ver4.01 25/50 User	$2467/3139
Ver4 .01 100/250 User	$4819/9143
Ver4 .01 500/1000 User	$15375/27932
Netware Personal 2User kit w/2 coax cards	$179
Netware Lite v1.1 w/Win utilities	$72
Netware Lite v1.1 w/Win Util&Dr. DOS	$90
Dr. DOS 6.0	$72

(Novel's prices are changing frequently, so please call for the latest price changes)

EIECTRONIC MAIL

by CC:MAIL

Platform Packs: *(For connectivity on all LANs and across all LAN Bridges and Gateways. For support of any combination of Server-to-Server, LAN-to-LAN, and Remote Workstation-to-LAN messaging. One Platform pack is required for configuring any system)*

CC:Mail DOS 4.2/Win 2.0/Unix 1.0	$199/325/345
CC:Mail Macintosh 2.0/OS2 3.2	$329/345

User Packs: *(For adding users to the Platform Pack)*

CC:Mail 10/25/100 user v4.0	$229/549/2097

Remote Users: *(For connecting one remote user to any CC:Mail user net via Public Telephone Lines)*

CC:Mail Remote for DOS3.3 or Mac 2.01	$199

Gateways: *(For exchange of messages with other CC:Mail Post Offices on the same LAN or Bridged LANs)*

CC:Mail Router v4.0/Fax 1.2	$839/1298

PEER-TO-PEER NETWORKS

ASA

(2) copies of Novell lite, (2) NE 2000C Cards, Cables, Terminators etc	$249

WINDOWS FOR WORKGROUP

Add-On 1 user kit w/Win3.1	$149
Add-On 1 user w/o Win 3.1	$48
Multi-Unit 20 Node/Server	$734
Windows NT Advanced server	$949
Windows NT v3.1 regular	$329

ARTISOFT PRODUCTS

AE-2 Starter Kit v5.0 DOS/Win	$454/525
AE-3 Starter Kit v5.0 DOS/Win	$525/545
AE-2/3 16 BitAdapter w/lantastic soft	$192/234
Lantastic 2MBPS Kit 5.0	$339
Lantastic v5.0 AI DOS 1/6/12pk	$81/479/959
Lantastic v5.0 AI Win 1/6/12pk	$93/549/1099
Lantastic for TCP/IP	$199
Lantastic for MAC	$524
Noderunner 2000C/T 1/6pk	$174/975
Noderunner 2000M/TC for PS/2	$259

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SUB-SYSTEMS with dual hot-swapable power supplies

HARDWARE RAID: Mylex one channel Disk Array Controller and Novell NLM

2GB,3ea.1GB drives,10msec	$7800
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4GB,5ea.1GB drives,10msec	$9995
5GB,3ea,2GB drives.,10msec	$11195
6GB,4ea,2GB ST Barracudas	$12995
8GB,5ea. 2GB ST Barracudas	$15495
1GB,Hot Spare	$1050
2GB,Barracuda Hot Spare	$2395
Add second channel module to split the drive packs	$895

SOFTWARE RAID: Subsystems includes NLM for Novell,Cd Rom, and Juke Box

3GB,4ea. 1GB drives,10msec	$5995
4GB,5ea.1GB drives,10msec	$6995
6GB,4ea.2GB drives,10msec	$9995
8GB,5ea.2GB drives,10msec	$11995
1GB Hot Spare	$1050
2GB Hot Spare	$1995

(For information on RAID products please call Paul Gulati at (408)496-6853 x 208 or 496-6953 for any sales person if Paul is unavailable)

UPS's

AMERICAN POWER

APC-BK250, 7 min, 386SX, ws	$102
APC-BK400, 10 min, 286, 386SX, ws	$158
APC-BK600, 15 min, 386 486 FS	$259
APC-BK900/1250, 15 min, Multi FSs	$381/561
Power Doctor/Call UPS	$69/102

SMART UPS (ON-LINE/AUTO BACKUP)

APC 400, 10 min, 288, 386 FS/WS	$288
APC 600, 15 min, 386, 486 FS/WS	$335
APC 900, 15 min CAD/CAM WS/FS	$546
APC 1250, 15 min, Multiple FSs	$677
APC 2000, 20 min, Mini Computers	$1134
Matrix UPS 3000 VA, Multi-server	$2869
SERENA 5.25" 300VA UPS mounts in PC	$call

INTERFACE KITS/SMART MONITORING

Power Chute Plus for Novell/Unix,Xen	$64/98
UPS Monitoring Board for Novell	$61

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Translated by Taku Fujita

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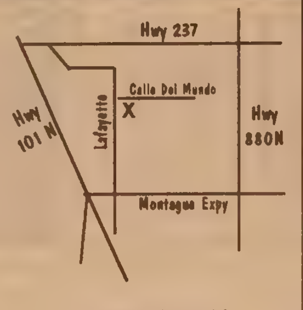

Santa Clara, CA

TERMS AND CONDITIONS

COD, FOB Santa Clara, CA. Credit terms are available on approval. Manufacturer's warranty on parts varies. Three years limited warranty on systems assembly labor only. Prices are subject to change. Prices in () or marked with a "*" are on cash basis only. Prices marked with "**" are clearance items & available while quantities last; regular prices for these items may be different.

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- 101 Keyboard
- 340MB IDE Hard Drive
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DX-33 .....$1295
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- 101 Keyboard
- 200MB IDE Hard Drive
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- 14" SVGA Monitor
- Mini-Tower or Desktop Case
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SX-25 or SX-33
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Trident SVGA w/1MB	$70
C-Logic VLB SVGA w/1MB	$99
Everex RAM 3000 Expansion Card	$90
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Baby AT w/200W Power	$70
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250W Power Supply	$60
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Frame for 3.5" Hard & Floppy Drive	$5
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CP-30204 200MB 16ms IDE	$220
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245MB 15ms SCSI HD	$250
LXT-213A 212MB 16ms IDE	$220
LXT-7245A 245MB IDE	$245
LXT-7345A 345MB IDE	$290
TEAC	
1.2MB 5.25"	$56
1.44MB 3.5"	$52

MODEMS

Mitac 2400/9600 Int. Fax Modem	$50
Everex 2400 Baud Ext. w/MNP5	$100
US ROBOTIC 14,400 Int. Fax Modem	$169
US ROBOTIC 14,400 Ext. Fax Modem	$189
US ROBOTIC 14,400 Int. Modem	$149
US ROBOTIC 14,400 Ext. Modem	$185

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Bundle Specials!

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- Kings Quest
- Mother Goose
- Family Choice
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- Battle Chess
- Mother Goose
- US Atlas & Automap
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Sound Blaster 16 Basic	$109
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387 SX-16	$115
387DX-20	$99
387 DX-25	$99
387 DX-33	$99

MEMORY CHIPS

DRAM	
1MBx1-8	$5.50
256K-8/10	$1.25
256Kx4-8	$5.50
64K-10	$1
SIMM	
4MB x9-7	CALL
1MBx9-7/8	CALL
1MBx3-7/8	CALL
SIPP	
1MBx9-8	CALL
256Kx9-8	CALL

MONITORS

14" Monochrome	$105
SVGA Monitor 1024x768 .28dp	$255
SVGA Monitor 1024x768 .39dp	$230
Relisys 14" SVGA Non-Int	$290
Relisys 15" SVGA Non-Int	$410
15" SVGA Monitor 1280x1024 NI	$375/$399
14" SVGA .28dp NI	$270

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386 SX 25MHz Motherboard	$110
386 DX 33MHz Motherboard	$150
386 DX 40MHz Motherboard	$160
486 DX2 66MHz Motherboard	$CALL
486 DX 33MHz Local Bus MB	$CALL
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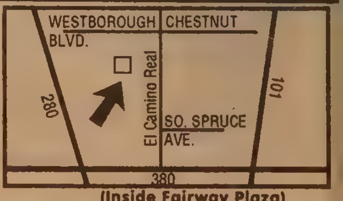

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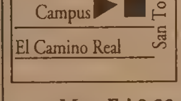

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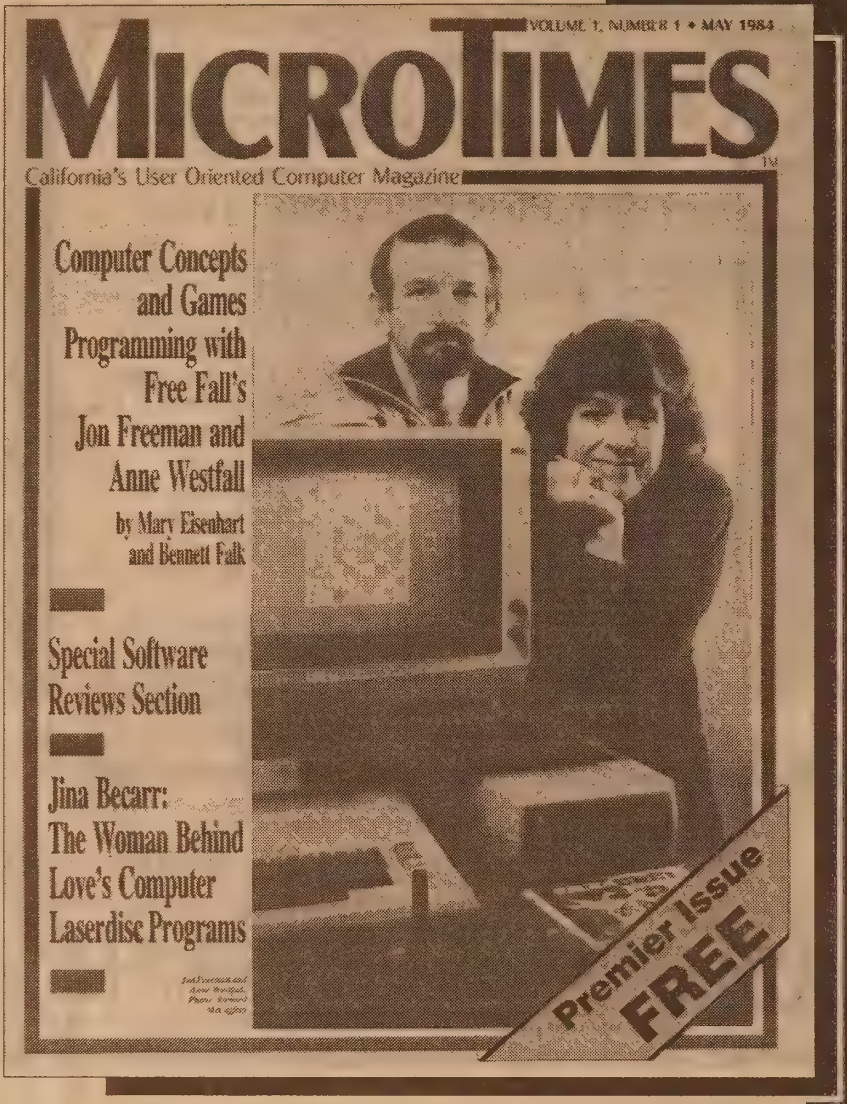

VOLUME 1, NUMBER 1 • MAY 1984

MICROTIMES

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by Mary Eisenhart and Bennett Falk

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MicroTimes

Pages From Our Past A decade ago, when the boss announced what we all considered his loony scheme to diversify into computer publishing, none of us had the foggiest notion of what the next ten years would be like. For our readers and ourselves, the personal computer changed the way we live and work immeasurably in that period, and the process shows no sign of stopping. On the whole, it's been an excellent adventure, and it's been our privilege and pleasure to write about it for you.

Anyone who comes to us looking for monolithic viewpoints is likely to be disappointed. We've been fortunate in the liveliness of the computer industry, and also in our writers, an opinionated lot who bring a wide variety of experiences to their work and frequently disagree, on everything from products to politics. Just like life.

To celebrate this anniversary, we're reprising four of our opinion pieces that appeared at various intervals over the last ten years. Each in its own way is both predictably dated and surprisingly timely; each in its season provoked a good deal of discussion and forceful expression of opinion (Dvorak, as we recall, got two extra columns just from hate mail responding to this particular opus. No doubt we'll get more this time...)

We'd like to thank you for your support over the last decade, and invite you to stay with us as we continue down the digital superhighway. We hope you enjoy these pages from our scrapbook.

—Mary Eisenhart

0
CROTIMES
YEAR
EBRATION

elebrates Ten Years of Interesting Times

April 1986
Beware The Turnpike Effect!
By Jan Lewis

This issue's cover trumpeted the dawn of the Amiga age.

We'll say more about the Amiga age shortly, when we get to Matthew Leeds and his 1992 Farewell to the Amiga; suffice it for now to note that as we go to press, Commodore is in liquidation and the nets are abuzz with rumors of the Amiga's impending acquistion by companies ranging from Philips to NewTek.

The cover photo featured William Volk and David Barrett of Aegis Development, a hopeful young Southern California startup with cool Amiga software. As often happens to hopeful young startups, Aegis gave up the ghost some years back; Volk and Barrett have continued to do interesting multimedia-related things in various settings.

My favorite memory from this issue is of standing in our booth at the Computer Faire passing out many, many copies, and being approached by a couple of disgusted-looking teenagers. Pointing to the cover as if it was week-old fish, they demanded to know why we were featuring the totally worthless Amiga at the expense of the overwhelmingly superior Atari ST. "Can't find any ST writers," I said, truthfully enough, handing them bizcards. "If you know any, have 'em call me."

Having clearly expected a religious debate, they retired from the scene. But a few months later, one of them wrote me, sending me tearsheets from the *Fresno Bee* to prove he could write, and asked if I'd let him do an Atari ST column.

Helmi Kobler was 17 at the time, and indeed he did an Atari ST column for some time. Eventually he went off to Cal, discovered desktop publishing, wrote books, and was most recently seen in the marketing department at 3DO.

Jan Lewis, author of this excerpt, is an industry analyst and consultant with Lewis Research in Sunnyvale. "Beware The Turnpike Effect" first appeared in *Computer Insider*, the newsletter published by the Palo Alto Research Group, of which Lewis was president.

—ME

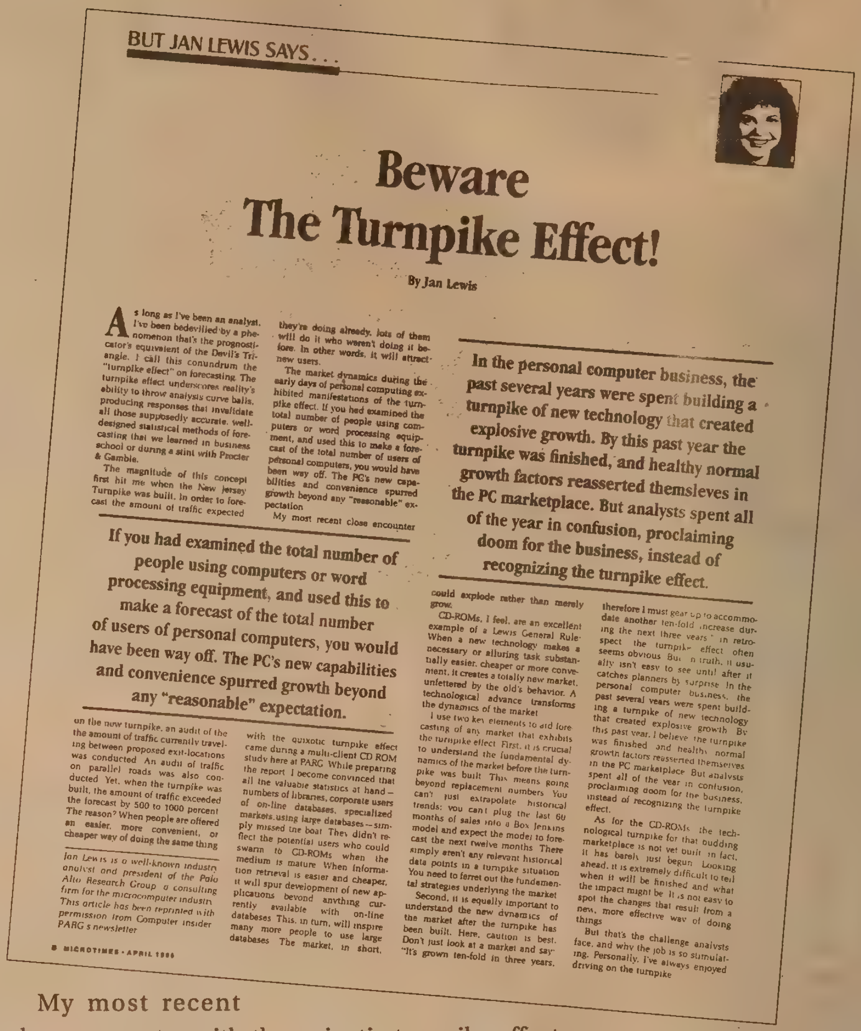
Beware the Turnpike Effect!

By Jan Lewis

As long as I've been an analyst, I've been bedeviled by a phenomenon that's the prognosticator's equivalent of the Devil's Triangle. I call this conundrum the "turnpike effect" on forecasting. The turnpike effect underscores reality's ability to throw analysts curve balls, producing responses that invalidate all those supposedly accurate, well-designed statistical methods of forecasting that we learned in business school or during a stint with Procter & Gamble.

The magnitude of this concept first hit me when the New Jersey Turnpike was built. In order to forecast the amount of traffic expected on the new turnpike, an audit of the amount of traffic currently traveling between proposed exit locations was conducted. An audit of traffic on parallel roads was also conducted. Yet, when the turnpike was built, the amount of traffic exceeded the forecast by 500 to 1000 percent. The reason? When people are offered an easier, more convenient, or cheaper way of doing the same thing they're doing already, lots of them will do it who weren't doing it before. In other words, it will attract new users.

The market dynamics during the early days of personal computing exhibited manifestations of the turnpike effect. If you had examined the total number of people using computers or word-processing equipment, and used this to make a forecast of the total number of users of personal computers, you would have been way off. The PC's new capabilities and convenience spurred growth beyond any "reasonable" expectation.



BUT JAN LEWIS SAYS . . .

Beware The Turnpike Effect!

By Jan Lewis

In the personal computer business, the past several years were spent building a turnpike of new technology that created explosive growth. By this past year the turnpike was finished, and healthy normal growth factors reasserted themsleves in the PC marketplace. But analysts spent all of the year in confusion, proclaiming doom for the business, instead of recognizing the turnpike effect.

If you had examined the total number of people using computers or word processing equipment, and used this to make a forecast of the total number of users of personal computers, you would have been way off. The PC's new capabilities and convenience spurred growth beyond any "reasonable" expectation.

MICROTIMES • APRIL 1986

My most recent close encounter with the quixotic turnpike effect came during a multi-client CD-ROM study here at PARC. While preparing the report, I became convinced that all the valuable statistics at hand—numbers of libraries, corporate users of on-line databases, specialized markets using large databases—simply missed the boat. They didn't reflect the potential users who could swarm to CD-ROMs when the medium is mature. When information retrieval is easier and cheaper, it will spur development of new applications beyond anything currently available with on-line databases. This, in turn, will inspire many more people to use large databases. The market, in short, could explode rather than merely grow.

CD-ROMs, I feel, are an excellent example of a Lewis General Rule: When a new technology makes a necessary or alluring task substantially easier, cheaper, or more convenient, it creates a totally new market, unfettered by the old's behavior. A technological advance transforms the dynamics of the market.

I use two key elements to aid forecasting of any market that exhibits the turnpike effect. First, it is crucial to understand the fundamental dynamics of the market before the turnpike was built. This means going beyond replacement numbers. You can't just extrapolate historical trends; you can't plug the last sixty months of sales into a Box Jenkins model and expect the model to forecast the next twelve months. There simply aren't any relevant historical data points in a turnpike situation. You need to ferret out the fundamental strategies underlying the market.

Second, it is equally important to understand the new dynamics of the market after the turnpike has been built. Here, caution is best. Don't just look at a market and say, "It's grown tenfold in three years, therefore I must gear up to accommodate another ten-fold increase during the next three years." In retrospect, the turnpike effect often seems obvious. But, in truth, it usually isn't easy to see until after it catches planners by surprise. In the personal computer business, the past several years were spent building a turnpike of new technology that created explosive growth. By this past year, I believe, the turnpike was finished, and healthy normal growth factors reasserted themselves in the PC marketplace. But analysts spent all of the year in confusion, predicting doom for the business, instead of recognizing the turnpike effect.

As for the CD-ROMs, the technological turnpike for that budding market-

continued

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NEC 3Xi (510) Triple Speed SCSI Internal	334
Orchid CDS3110 (Double Speed) w/Card	158
Panasonic CD-562 (Double Speed) w/Card	146
Phillips CD-ROM w/Card	84
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TEXEL DM3028 (SCSI) Internal	268
Toshiba XM-3401B (SCSI) Int / Ext	294 / 358
Trantor SCSI Host w/Driver	48
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Atlas Pak v3.1 World/US	15
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Battle Chess DOS	15
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Mayo Clinic Family Health	15
Micropose Collection 4 Games	16
Microsoft Bookshelf MPC	28
Microsoft Bookshelf, Mixed Up Mother Goose King's Quest V, Thunder-Media Sound Library	48
Microsoft Works MPC	28
MIDI Music Shop	15
Mixed-up Mother Goose MPC	12
Monkey Island DOS	12
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National Geographic Mammals DOS	16
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Playing with Language (French)	16
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US Atlas v3.1 MPC	13
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USA Wars: WW II DOS/MAC	22
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Adaptec	
1542CF (SCSI)	162
1542CFK w/Kit (SCSI)	228
2742 EISA (SCSI)	242
2742TK EISA (SCSI)	340
2742T EISA (Twin SCSI)	270
2842 VLB SCSI	254
Asus EISA (SCSI)	248
Asus PCI (SCSI)	78
BusLogic 445S VLB (SCSI)	224
BusLogic 742K EISA (SCSI)	238
DTC 2290 EISA IDE	116
DTC 2280 ISA IDE	14
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Promise DC-200 IDE Cache Controller	88
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Fax Modem (14,400 Fax/14,400Modem) Ext.	108
Fax Modem 28.8 (28.8 Data, 14.4 Fax) Int	188
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Hayes 14400 Fax Modem Int/Ext	148 / 168
Intel 14.4 Fax Modem Int/Ext	154 / 178
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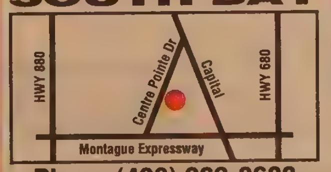

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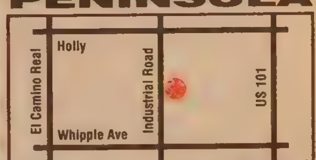

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place is not yet built; in fact, it has barely just begun. Looking ahead, it is extremely difficult to tell when it will be finished and what the impact might be. It is not easy to spot the changes that result from a new, more effective way of doing things.

But that's the challenge analysts face, and why the job's so stimulating. Personally, I've always enjoyed driving on the turnpike.

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August 1988
What DO Women Want?
By John C. Dvorak

Here at *MicroTimes*, where real women use PowerMacs, there has never been any great shortage of those willing to cite the many pathological clue deficiencies evidenced in this particular column. Some of us, for example, take exception to the suggestion that what women want is somehow different from what people want. Some wonder just exactly where A. Jesse Ivanhoe (who sent copies of this letter to other journalists as well) was getting his demographic samples—perhaps in the Barbie section of Toys-R-Us. Some become livid at Dvorak's invitation to the "gals" to comment.

As far as we know, Mr. Ivanhoe's idea never did find favor in the investment community or the great consumer marketplace, although elements of his proposal are evident in PDAs of various types. I did, however, find it disconcerting to find, at a Japanese trade show in 1990, a bevy of designer-colored handbag-sized devices clearly being marketed as "women's computers." However, the target customer appeared to be Office Ladies, and the software was strictly business.

In the years since this column appeared, thousands of women have rendered it irrelevant by going out and getting computers to use for whatever they happened to want to do. While the occasional product comes along that's explicitly designed for women (e.g. the Women's Wire online service), a clearly differentiated "women's market" has failed to develop (rather as it failed to develop in the automobile industry in a previous age).

However, with the latest round in popular computing, from home office to recreational multimedia to wireless communicators, controversy continues over many issues related to women and technology, from access to interface design. Designing games that appeal to girls is a subject that generates endless posturing and, by most accounts, very little good product.

We still tend to scratch our heads in disbelief at Mr. Ivanhoe's well-meaning vision of powderpuff computing. However, in a world where commercial nirvana has been attained by an overstuffed purple dinosaur, you never know.

—*ME*

Great Issues of the 21st Century.
What DO Women Want in a Personal Computer? An Immodest Proposal, Or, a Computer for Bimbos?
Would Your Mother Buy This Concept?

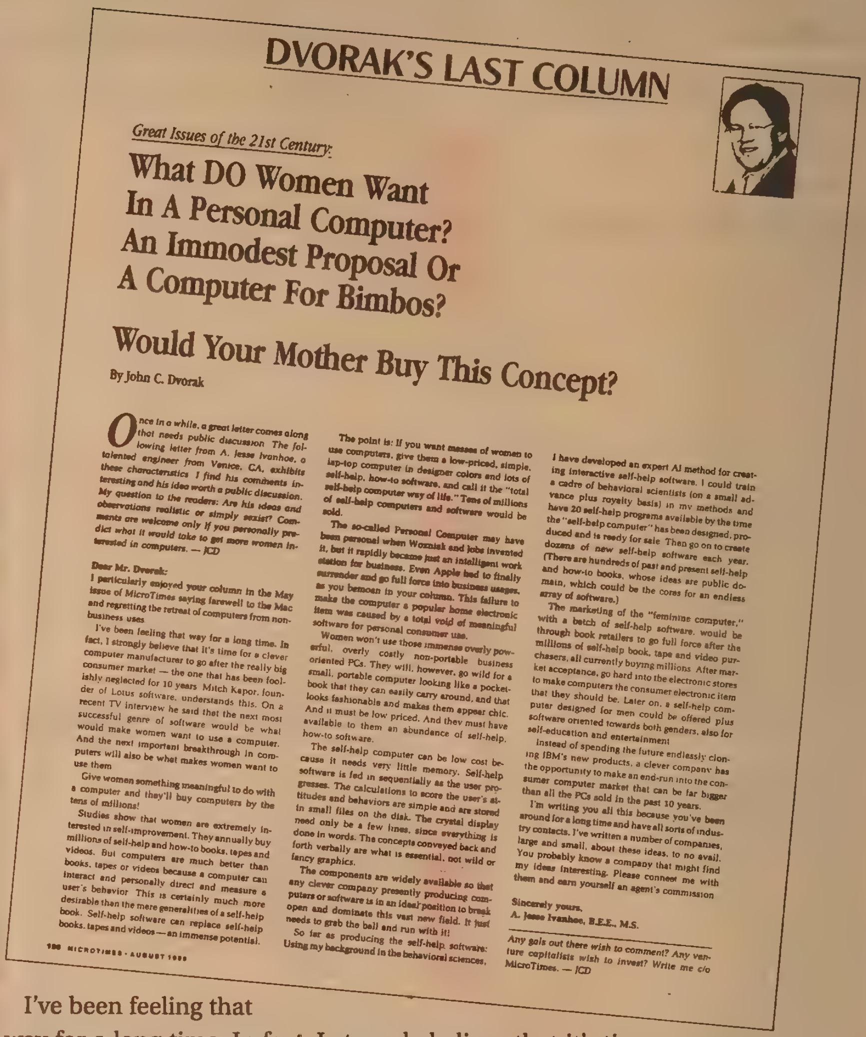
By John C. Dvorak

Once in a while, a great letter comes along that needs public discussion. The following letter from A. Jesse Ivanhoe, a talented engineer from Venice, CA, exhibits these characteristics. I find his comments interesting and his idea worth a public discussion. My question to the readers: Are his ideas and observations realistic or simply sexist? Comments are welcome only if you personally predict what it would take to get more women interested in computers.

—*JCD*

Dear Mr. Dvorak:

I particularly enjoyed your column in the May issue of *MicroTimes* saying farewell to the Mac and regretting the retreat of computers from non-business uses.



DVORAK'S LAST COLUMN

Great Issues of the 21st Century:

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Would Your Mother Buy This Concept?

By John C. Dvorak

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Dear Mr. Dvorak:

I particularly enjoyed your column in the May issue of MicroTimes saying farewell to the Mac and regretting the retreat of computers from non-business uses.

I've been feeling that way for a long time. In fact, I strongly believe that it's time for a clever computer manufacturer to go after the really big consumer market — the one that has been foolishly neglected for 10 years. Mitch Kapor, founder of Lotus software, understands this. On a recent TV interview he said that the next most successful genre of software would be what would make women want to use a computer. And the next important breakthrough in computers will also be what makes women want to use them.

Give women something meaningful to do with a computer and they'll buy computers by the tens of millions!

Studies show that women are extremely interested in self-improvement. They annually buy millions of self-help and how-to books, tapes and videos. But computers are much better than books, tapes or videos because a computer can interact and personally direct and measure a user's behavior. This is certainly much more desirable than the mere generalities of a self-help book. Self-help software can replace self-help books, tapes and videos — an immense potential.

The point is: If you want masses of women to use computers, give them a low-priced, simple, lap-top computer in designer colors and lots of self-help, how-to software, and call it the "total self-help computer way of life." Tens of millions of self-help computers and software would be sold.

The so-called Personal Computer may have been personal when Wozniak and Jobs invented it, but it rapidly became just an intelligent work station for business. Even Apple had to finally surrender and go full force into business usages, as you bemoan in your column. This failure to make the computer a popular home electronic item was caused by a total void of meaningful software for personal consumer use.

Women won't use those immense overly powerful, overly costly non-portable business oriented PCs. They will, however, go wild for a small, portable computer looking like a pocketbook that they can easily carry around, and that looks fashionable and makes them appear chic. And it must be low priced. And they must have available to them an abundance of self-help, how-to software.

The self-help computer can be low cost because it needs very little memory. Self-help software is fed in sequentially as the user progresses. The calculations to score the user's attitudes and behaviors are simple and are stored in small files on the disk. The crystal display need only be a few lines, since everything is done in words. The concepts conveyed back and forth verbally are what is essential, not wild or fancy graphics.

The components are widely available so that any clever company presently producing computers or software is in an ideal position to break open and dominate this vast new field. It just needs to grab the ball and run with it!

So far as producing the self-help software: Using my background in the behavioral sciences, I have developed an expert AI method for creating interactive self-help software. I could train a cadre of behavioral scientists (on a small advance plus royalty basis) in my methods and have 20 self-help programs available by the time the "self-help computer" has been designed, produced and is ready for sale. Then go on to create dozens of new self-help software each year. (There are hundreds of past and present self-help and how-to books, whose ideas are public domain, which could be the cores for an endless array of software.)

The marketing of the "feminine computer," with a batch of self-help software, would be through book retailers to go full force after the millions of self-help book, tape and video purchasers, all currently buying millions. After market acceptance, go hard into the electronic stores to make computers the consumer electronic item that they should be. Later on, a self-help computer designed for men could be offered plus software oriented towards both genders, also for self-education and entertainment.

Instead of spending the future endlessly cloning IBM's new products, a clever company has the opportunity to make an end-run into the consumer computer market that can be far bigger than all the PCs sold in the past 10 years.

I'm writing you all this because you've been around for a long time and have all sorts of industry contacts. I've written a number of companies, large and small, about these ideas, to no avail. You probably know a company that might find my ideas interesting. Please connect me with them and earn yourself an agent's commission.

Sincerely yours,
A. Jesse Ivanhoe, B.E.E., M.S.

Any gals out there wish to comment? Any venture capitalists wish to invest? Write me c/o MicroTimes. — JCD

[illegible] MICROTIMES • AUGUST 1988

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486DX-33/128K VLB	975
486DX-40/128K VLB	985
486DX2-50/128K VLB	1,015
486DX-50/128K VLB	1,105
486DX2-66/128K VLB	1,155
486DX2-66/256K PCI	1,315
Pentium P5-60/256K VLB USA M/B	1,765
Pentium P5-66/256K VLB USA M/B	1,855

SYSTEM CONFIGURATION

- Motherboard w/CPU
- 4 MB RAM 70NS
- 170MB Fast Hard Drive
- 1.2MB and 1.44MB Floppy Drive
- IDE 2HD/2FD Controller w/2S/1P/1G
- 512KB SVGA Card
- 14" SVGA .28 Color Monitor
- 101-Key Enhanced Keyboard
- Enhanced Case w/Power Supply
- Microsoft Compatible Mouse w/Pad

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• 15" Non-Interlaced Monitor	Add $100
• VLB IDE Controller	Add $20
• PCI Bus VGA Card w/1MB	Add $100
• 16BIT SVGA Card w/1MB	Add $20
• Window Accelerator w/1MB	Add $30
• Orchid Fahrenheit 1280	Add $100
• Diamond S.S. Pro VLB w/1MB	Add $70
• 250MB Tape Back-up	Add $130
• 16BIT Ethernet Card	Add $40
• Deluxe Speakers	Add $10
• Mitsumi CD-ROM w/Card	Add $120
• Double Speed CD-ROM w/Card	Add $150
• Sound Blaster Pro Deluxe	Add $80
• Mediavision Jazz 16	Add $100
• CD Deluxe Pak (4 Titles)	Add $24

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420MB	CPS420A	<12ms	3.5"x1"	$300
540MB	CP30544	<12ms	3.5"x1"	$369

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IDE HARD DRIVES

250MB	WD2250	13ms	3.5"x1"	$215
340MB	WD2340	12ms	3.5"x1"	$249
420MB	WD2420	13ms	3.5"x1"	$378
540MB	WD2540	12ms	3.5"x1"	$395

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Super Voyager II 486-33 256k VLB, 7 Slots	$645
Super Voyager II 486-DX2-66 VLB, 7 Slots	$845
Enterprise III 486-33 256k EISA VLB	$875
Enterprise III 486-DX2-66 EISA VLB	$1,095
Enterprise IV 486-33 256k EISA VLB	$735
Enterprise IV 486-DX2-66 256k EISA VLB	$935
ALARIS (IBM)	
486SLC2-66 64k VLB w/CPU & Math Proc.	$299
DIAMOND	
486-DX Fast Bus VLB	$185
IBM	
486BL3X-75MHz VLB w. CPU & Math Proc.	$499
486SLC-33 / 66 16k Internal cache ISA v.2 w. CPU & Math Proc	$259
LYNX (USA made)	
486-33 / 50 / DX2-66 256k VLB	$149
MICRONICS	
386-33 64k Gemini, 32MB max	$245
BCP 386-33 64k, 4MB max w/o CPU	$85
w. CPU	$145
486-33 256k VLB	$535
486-DX2-66 256k VLB	$655
JX30 486-DX2-66 256k VLB w. Zif socket	$725
486-33 256k EISA VLB	$795
486-DX2-66 256k EISA E2	$820
486-DX2-66 256k EISA VLB	$920
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Mediavision Pro Audio Spectrum 16	$98
Mediavision Pro Audio Studio 16	$138
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Orchid Soundwave Sound Card (AT)	$170
Chinon CDS535 (Int.) SCSI	$294
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NEC 3XI (510) Triple Speed SCSI Internal	$338
Orchid CDS3110 (Double Speed) w/Card	$158
Panasonic CD-562 (Double Speed) w/Card	$148
Phillips CD-ROM w/Card	$88
SONY CD-ROM (Double Speed) w/Card	$144
TEXEL	
DM3021 (SCSI) Internal	$158
DM3028 (SCSI) Internal	$298
Toshiba XM-3401B (SCSI) Int / Ext	$298 / 340
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3C509-16 Etherlink III 16 bit Coax/TP	$135 / 140
COMPULAN	
NE 600E 16 bit TP	$75
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SuperVGA (1024x768,0.28mm) Arche	$240
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NEC 3FGe 15" Flat Screen	$563
NEC 4FGe 15" Flat Screen	$624
NEC 5FGe 17" Flat Screen	$988
NEC 5FGp 17" Flat Screen	$1,128
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Viewsonic 6E 14" 0.28DP	$272
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Viewsonic 17 17" 0.28DP	$924
Viewsonic 20 20" 0.28DP	$1,486
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Mag 15F 15" 0.28DP (PC Editor Choice)	$428
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SONY 1730 17" 1024x768 0.25DP	$878
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SONY 2036 20" 1280x1024 0.30DP	$2,295

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Trident 512k Card/Trident 1MB card	$38 / 55
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Cirrus Logic VLB 1MB/2MB	$69 / 115
Trident VLB Plus 1MB/2MB	$69 / 115
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Orchid Farenheit VLB VA 1MB/2MB	$195 / 235
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Diamond Speedstar Pro 1MB	$100
Diamond Stealth 24 VLB 1MB	$138
Diamond Stealth Pro VLB 1MB/2MB	$236 / 298
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AIR Star-2000 VLB Weitek Chipset 2MB	$360
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Zoltrix 14.4K V.32bis, V.42bis I/E	$125 / 175
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Orchid VLB IDE & I/O Support 2.88FD Fast	$60
DTC 2270VL VLB IDE & I/O Fast	$75
Promise DC-4030VL IDE VLB CACHE	$135
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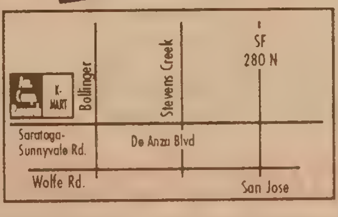

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- •256K Cache
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- •VLB SVGA Windows Acc. Card w/1MB
- •Crystal Clear 14" .28dp Energy Star Monitor
- •Baby Case w/200W Green P.S.
- •101 Key Click Keyboard

DX2-66 *Best Buy*	**$1182**
DX-50	$1205
DX-40	$1040
DX-33	$1071

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- •1.44 Floppy Drive
- •VLB IDE Controller w/2S,1P, & 1G
- •VLB SVGA Windows Acc.w/1MB
- •Crystal Clear 14" .28dp Energy Star Monitor
- •Baby Case w/230W P.S.
- •101 Key Click Keyboard

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DX-40	$1170
DX-33	$1201

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- •1.44 Floppy Drive
- •VLB IDE Controller w/2S,1P, & 1G
- •Cirrus Logic Windows Acc. SVGA w/1MB Adapter
- •Crystal Clear 14" .28dp Energy Star Monitor
- •Baby Case w/230W P.S.
- •101 Key Click Keyboard

DX2-66 *Best Buy*	**$1072**
DX-40	$984
DX-33	$1015
SX-33	$867

Student Systems

- •386DX 40MHz CPU
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- •2MB RAM
- •200MB Hard Drive
- •1.44 Floppy Drive
- •IDE Controller w/2S,1P, & 1G
- •SVGA Card w/512K
- •Crystal Clear 14" .28dp Monitor
- •Baby Case w/230W P.S.
- •101 Key Click Keyboard

DX-40............$713

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486DX-50 256K VLB	$461
486DX-40 256K VLB	$299
486DX-33 256K VLB	$332
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  - *-Reference Library*
  - *-World Atlas*
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- • Stereo Speakers
- • Microphone
- • Includes 6 CD titles
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$378

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Panasonic 562	148
Sony 33A	140
Toshiba 3401B SCSI	308

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Sound Blaster Pro Deluxe VALUE	$90
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Sound Blaster 16 Multi CD ASP	183
Sound Blaster 16 SCSI II	175
Sound Blaster 16 SCSI II ASP	203
Sound Blaster ANE 32	270

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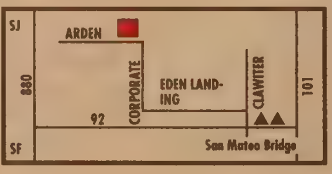

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DIAMOND Speed Star Pro VLB w/1MB	103
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DIAMOND Stealth 32 w/2MB RAM VLB/PCI	200/208
DIAMOND Stealth 24 w/1MB (ISA/VLB)	139
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ORCHID Fahrenheit VLB w/1MB	135
ORCHID Fahrenheit 1280 Plus w/1MB	135
TSENG Lab VGA w/1MB	68
Cirrus Logic w/1MB Windows Accelerator	56
Trident VLB w/1MB	66
NEC 3V	495
NEC 4FGE/5FGE	650/1025
SONY 1430/17SE1	1169/1528
Viewsonic 4E/6E	253/270
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CONTROLLER

IDE 2FD/2HD with 2S/1P/1G	13
Promise DC-200M IDE w/512K Cache exp to 8 MB	90
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Adaptec SCSI VLB 2842	280
VLB IDE Controller 2FD/2HD with 2S/1P/1G	25

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170MB 16ms IDE	180
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250MB 14ms IDE	210
340MB 14ms IDE	253
420MB 13ms IDE	275

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Tower Case full size, 6 drives, 250wps	$88
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Fax Modem (14,400 Fax, 14,400 Modem)(For DOS & WIN)	98
Serial Mouse (Color)	10
Power Center/Power Strip	14/3
Colorado Tape Backup 250MB	153
16-Bit Ethernet Card 10 Base-T	40
SIMM/CPU/SRAM/DRAM	LOWEST
Math-Co 387DX-33/40	47/48
Math-Co 387SX-25/33	45/46

be low priced. And they must have available to them an abundance of self-help, how-to software.

The self-help computer can be low cost because it needs very little memory. Self-help software is fed in sequentially as the user progresses. The calculations to score the user's attitudes and behaviors are simple and are stored in small files on the disk. The crystal display need only be a few lines, since everything is done in words. The concepts conveyed back and forth verbally are what is essential, not wild and fancy graphics.

The components are widely available so that any clever company presently producing computers or software is in an ideal position to break open and dominate this vast new field. It just needs to grab the ball and run with it!

So far as producing the self-help software: Using my background in the behavioral sciences, I have developed an expert AI method for creating interactive self-help software. I could train a cadre of behavioral scientists (on a small advance plus royalty basis) in my methods and have 20 self-help programs available by the time the "self-help computer" has been designed, produced, and is ready for sale. Then go on to create dozens of new self-help software programs each year. (There are hundreds of past and present self-help and how-to books, whose ideas are public domain, which could be the cores for an endless array of software.)

The marketing of the "feminine computer," with a batch of self-help software, would be through book retailers to go full force after the millions of self-help book, tape, and video purchasers, all currently buying millions. After market acceptance, go hard into the electronic stores to make computers the consumer electronics item that they should be. Later on, a self-help computer designed for men could be offered plus software oriented towards both genders, also for self-education and entertainment.

Instead of spending the future endlessly cloning IBM's new products, a clever company has the opportunity to make an end-run into the consumer computer market that can be far bigger than all the PCs sold in the past 10 years.

I'm writing you all this because you've been around for a long time and have all sorts of industry contacts. I've written a number of companies, large and small, about these ideas, to no avail. You probably know a company that might find my ideas interesting. Please connect me with them and earn yourself an agent's commission.

Sincerely yours,
A. Jesse Ivanhoe, B.E.E., M.SP—

Any gals out there wish to comment? Any venture capitalists wish to invest? Write me c/o MicroTimes—JCD

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January 1989
Fear And Loathing At COMDEX
By John Perry Barlow

Retired cattle rancher and Grateful Dead lyricist Barlow made his first appearance in computer journalism with this screed on trade-show hell and industry malaise. He subsequently went on to many memorable interviews in our pages (including Bill Gates and Steve Jobs, though not together). One such interview was with Mitch Kapor, a momentous occasion that eventually led to the creation of the Electronic Frontier Foundation.

While massive conventions are no more edifying now than they were five years ago, and the eternal conflict between the forces of creativity and the minions of soul death continues unabated, this column is perhaps the most dated of our four excerpts. It reflects a world in which Microsoft and IBM are still speaking to each other and Businessland still exists. The current IBM, while still going through troubled times, is far more nimble and lively than the moribund dinosaur portrayed here; speakers Conrades and Lowe are now long gone. Why, Apple and IBM even have some promising joint ventures these days.

As further evidence of the ever-shifting terrain, consider the cover of this issue, which features Claris CEO Bill Campbell discussing the company's impending independence from Apple. That, of course, never happened, and Campbell subsequently went to GO. GO having been essentially re-absorbed by AT&T, Campbell is now the new CEO at the wildly successful Intuit.

This issue also featured an interview with pioneer Doug Engelbart by Howard Rheingold. Engelbart, you'll be pleased to know, continues his work at the Bootstrap Institute, housed at Logitech in Fremont; Rheingold, of course, went on to many exploits, the most recent of which is the best-selling book, *The Virtual Community.*

Fear and Loathing at COMDEX

By John Perry Barlow

"We are the hollow men
We are the stuffed men
Leaning together
Headpiece filled with straw. Alas!
Our dried voices, when
We whisper together
Are quiet and meaningless
As wind in dry grass
Or rats' feet over broken glass
In our dry cellar
Shape without form, shade without colour,
Paralysed force, gesture without motion..."

—*from* *The Hollow Men* by T.S. Eliot

Never having been to a COMDEX, I wondered why the largest of computer trade shows would be held in Las Vegas. Seemed like an odd setting.

Unlike Vegas, computers are magical to me. I think of their development as a kind of holy undertaking. Through them, we might be creating a new form of life. At the least we're redesigning our own minds, gearing up to think, as J.C.R. Licklider put it: "as no human has ever thought."

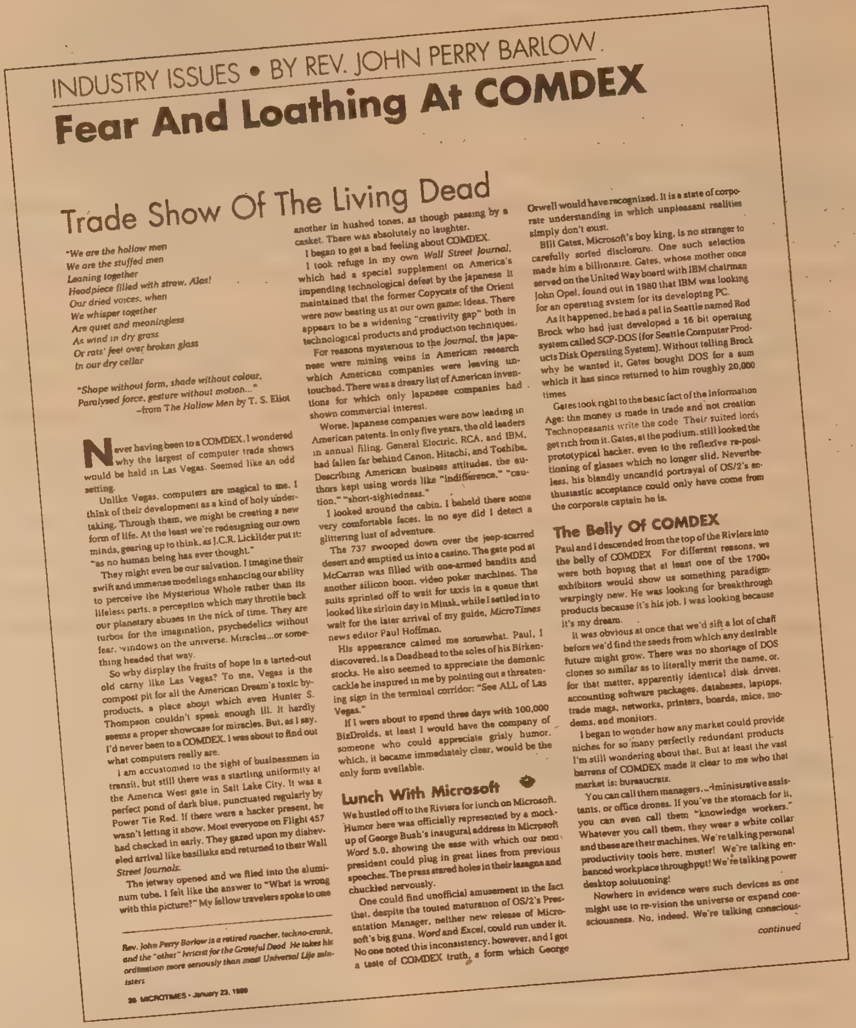
They might even be our salvation. I imagine their swift and immense modelings enhancing our ability to perceive the Mysterious Whole rather than its lifeless parts, a perception which may throttle back our planetary abuses in the nick of time. They are turbos for the imagination, psychedelics without fear, windows on the universe. Miracles...or something headed that way.

So why display the fruits of hope in a tarted-out old carny like Las Vegas? To me, Vegas is the compost pit for all the American Dream's toxic by-products, a place about which even Hunter S. Thompson couldn't speak enough ill. It hardly seems a proper showcase for miracles. But, as I say, I'd never been to a COMDEX. I was about to find out what computers really are.

I am accustomed to the sight of businessmen in transit, but still there was a startling uniformity at the America West gate in Salt Lake City. It was a perfect pond of dark blue, punctuated regularly by Power Tie Red. If there were a hacker present, he wasn't letting it show. Most everybody on Flight 457 had checked in early. They gazed upon my disheveled arrival like basilisks and returned to their *Wall Street Journals.*

The jetway opened and we filed into the aluminum tube. I felt like the answer to "What is wrong with this picture?" My fellow travelers spoke to one another in hushed tones, as though passing by a casket. There was absolutely no laughter.

MicroTimes Celebrates Ten Years continued



INDUSTRY ISSUES • BY REV. JOHN PERRY BARLOW

Fear And Loathing At COMDEX

Trade Show Of The Living Dead

"We are the hollow men
We are the stuffed men
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Headpiece filled with straw. Alas!
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Unlike Vegas, computers are magical to me. I think of their development as a kind of holy undertaking. Through them, we might be creating a new form of life. At the least we're redesigning our own minds, gearing up to think, as J.C.R. Licklider put it: "as no human being has ever thought."

They might even be our salvation. I imagine their swift and immense modelings enhancing our ability to perceive the Mysterious Whole rather than its lifeless parts, a perception which may throttle back our planetary abuses in the nick of time. They are turbos for the imagination, psychedelics without fear, windows on the universe. Miracles...or something headed that way.

So why display the fruits of hope in a tarted-out old carny like Las Vegas? To me, Vegas is the compost pit for all the American Dream's toxic byproducts, a place about which even Hunter S. Thompson couldn't speak enough ill. It hardly seems a proper showcase for miracles. But, as I say, I'd never been to a COMDEX. I was about to find out what computers really are.

I am accustomed to the sight of businessmen in transit, but still there was a startling uniformity at the America West gate in Salt Lake City. It was a perfect pond of dark blue, punctuated regularly by Power Tie Red. If there were a hacker present, he wasn't letting it show. Most everyone on Flight 457 had checked in early. They gazed upon my dishevelled arrival like basilisks and returned to their Wall *Street Journals.*

The jetway opened and we filed into the aluminum tube. I felt like the answer to "What is wrong with this picture?" My fellow travelers spoke to one another in hushed tones, as though passing by a casket. There was absolutely no laughter.

I began to get a bad feeling about COMDEX.

I took refuge in my own *Wall Street Journal*, which had a special supplement on America's impending technological defeat by the Japanese. It maintained that the former Copycats of the Orient were now beating us at our own game: ideas. There appears to be a widening "creativity gap" both in technological products and production techniques.

For reasons mysterious to the *Journal*, the Japanese were mining veins in American research which American companies were leaving untouched. There was a dreary list of American inventions for which only Japanese companies had shown commercial interest.

Worse, Japanese companies were now leading in American patents. In only five years, the old leaders in annual filing, General Electric, RCA, and IBM, had fallen far behind Canon, Hitachi, and Toshiba. Describing American business attitudes, the authors kept using words like "indifference," "caution," "short-sightedness."

I looked around the cabin. I beheld there some very comfortable faces. In no eye did I detect a glittering lust of adventure.

The 737 swooped down over the jeep-scarred desert and emptied us into a casino. The gate pod at McCarran was filled with one-armed bandits and another silicon boon, video poker machines. The suits sprinted off to wait for taxis in a queue that looked like sirloin day in Minsk, while I settled in to wait for the later arrival of my guide, *MicroTimes* news editor Paul Hoffman.

His appearance calmed me somewhat. Paul, I discovered, is a Deadhead to the soles of his Birkenstocks. He also seemed to appreciate the demonic cackle he inspired in me by pointing out a threatening sign in the terminal corridor: "See ALL of Las Vegas."

If I were about to spend three days with 100,000 BizDroids, at least I would have the company of someone who could appreciate grisly humor, which, it became immediately clear, would be the only form available.

Lunch With Microsoft

We hustled off to the Riviera for lunch on Microsoft. Humor here was officially represented by a mockup of George Bush's inaugural address in Microsoft *Word* 5.0, showing the ease with which our next president could plug in great lines from previous speeches. The press stared holes in their lasagna and chuckled nervously.

One could find unofficial amusement in the fact that, despite the touted maturation of OS/2's Presentation Manager, neither new release of Microsoft's big guns, *Word* and *Excel*, could run under it. No one noted this inconsistency, however, and I got a taste of COMDEX truth, a form which George Orwell would have recognized. It is a state of corporate understanding in which unpleasant realities simply don't exist.

Bill Gates, Microsoft's boy king, is no stranger to carefully sorted disclosure. One such selection made him a billionaire. Gates, whose mother once served on the United Way board with IBM chairman John Opel, found out in 1980 that IBM was looking for an operating system for its developing PC.

As it happened, he had a pal in Seattle named Rod Brock who had just developed a 16 bit operating system called SCP-DOS (for Seattle Computer Products Disk Operating System). Without telling Brock why he wanted it, Gates bought DOS for a sum which it has since returned to him roughly 20,000 times.

Gates took right to the basic fact of the Information Age: the money is made in trade and not creation. Technopeasants write the code. Their suited lords get rich from it. Gates, at the podium, still looked the prototypical hacker, even to the reflexive re-positioning of glasses which no longer slid. Nevertheless, his blandly uncandid portrayal of OS/2's enthusiastic acceptance could only have come from the corporate captain he is.

The Belly Of COMDEX

Paul and I descended from the top of the Riviera into the belly of COMDEX. For different reasons, we were both hoping that at least one of the 1700+ exhibitors would show us something paradigm-warpingly new. He was looking for breakthrough products because it's his job. I was looking because it's my dream.

It was obvious at once that we'd sift a lot of chaff before we'd find the seeds from which any desirable future might grow. There was no shortage of DOS clones so similar as to literally merit the name, or, for that matter, apparently identical disk drives, accounting software packages, databases, laptops, trade mags, networks, printers, boards, mice, modems, and monitors.

I began to wonder how any market could provide niches for so many perfectly redundant products. I'm still wondering about that. But at least the vast barrens of COMDEX made it clear to me who that market is: bureaucrats.

You can call them managers, administrative assistants, or office drones. If you've the stomach for it, you can even call them "knowledge workers." Whatever you call them, they wear a white collar and these are their machines. We're talking personal productivity tools here, mister! We're talking enhanced workplace throughput! We're talking power desktop solutioning!

Nowhere in evidence were such devices as one might use to re-vision the universe or expand consciousness. No, indeed. We're talking conscious-

continued

Rev. John Perry Barlow is a retired rancher, techno-crank, and the "other" lyricist for the Grateful Dead. He takes his ordination more seriously than most Universal Life ministers.

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Nowhere in evidence were there such devices as one might use to re-vision the universe or expand consciousness. No, indeed. We're talking consciousness contraction!

Plenty of which had apparently taken place. Take the matter of gender equality. After Paul and I had tramped three or four miles of COMDEX carpeting, I muttered, "Where do they get all these *girls?*"

Paul is from Berkeley and immediately asserted his political correctness with, "Don't you mean to say '*women*'?"

I did not mean to say women, my choice of term having been guided by application. These persons, dizzyingly sexy in their short-skirted business suits, were unquestionably being *used* as girls. Or, more precisely, bait. Their employers hovered behind them, trolling the aisles for randy resellers.

Though their badges might indicate a position with Texxcom or PowerWare or whatever, many of them were obviously daylighting from such employment as "Nudes on Ice," and, in fact, I did see one of them well out of her business suit later on.

The marketers would have done better to employ these ladies in their pro-

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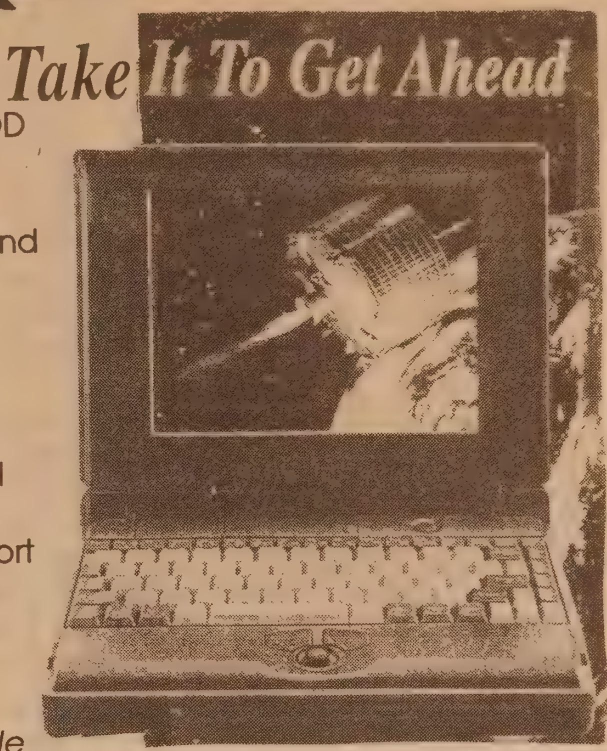

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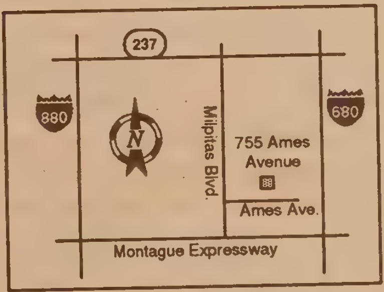

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fessional capacity. A large number of companies were putting on small theatrical pieces. Given the talent displayed in them, one had to assume that many of the performers really did work for the company on a regular basis and were reviving thespian skills last exhibited in their Junior Class production of Oklahoma!

Apart from social benightedness, consciousness contraction had worked an intense effect on the nature of the displayed products themselves. It had squeezed most of the imagination out of what made it to this vast venue, a place where ideas should be the chief raw material.

For all the multitude of microcomputers, there are two permissible case colors: beige for the desk and flat black for the lap. You can't judge a box by its color, but it was no different within, where there were two permissible CPUs, the 80286 and the 80386.

Where was the Macintosh? Nowhere and everywhere. Actual Macintoshes were rare indeed. But an observer fresh to the scene would think that something very much like the Macintosh was the hottest news of the year. With the release of Presentation Manager, the graphical interface is at last IN. Never mind that few applications would actually run under PM, Microsoft Windows had the look.

The number of passing moments when I *thought* I was looking at the paper white windows of a Mac screen would certainly bolster Apple's legal case against Microsoft.

We were treated to many demonstrations of the ease of such thrilling new technology as clickable icons, multiple applications running in tiled windows, and other elements in the desktop metaphor. The most shameless of these was IBM's own theatrical extravaganza which breathlessly demonstrated four-year-old technology as though it were tomorrow's.

"If this is so great," I asked Paul, "Why didn't these people go for Macs a long time ago?"

"Didn't know about 'em, I guess." After all, they weren't IBM technology. And, as is commonly known, no one was ever fired for buying Big Blue.

In other words, the tyranny of job security and consensus. The proper course is the one which won't get you fired. A market as paranoid and conformist as that defined by white collar managers will not exactly propel innovation by its hunger for the new. The results of this natural timidity showed all over COMDEX.

That which was innovative was almost invariably both developmental and foreign. Like Nissei Sangyo's optical disk jukebox, a storage device about the size of a Sun CPU into which one could pack a significant percentage of the Library of Congress. Or Sony's DAT tape drive which could store 1.3 gigabytes in a package so small you could probably use body cavities for smuggling it. Or Twix's personal data microwave which, for five grand, will blast your data across town at 19,200 squeaky clean baud. This product came from those notoriously imaginative folks, the Swiss.

In search of American breakthroughs, Paul and I went to the Hall of Press Kits, a quarter acre of glossy PR. I descended immediately into datashock, stumbling behind Paul, stupid with brain-glaze. Never have I seen so many words say so little. Nor did one detect an endangering level of excitement out in the vast barrens of the exhibit halls. Aside from the dress code, the scene kept reminding me of a suburban mall a couple of days after Thanksgiving. Clutching their bulging and gaily-colored plastic bags, the COMDEX-oids had the look of shoppers in major migration. There was that same uneasy satiety, the same troubled self-absorption, the same utter joylessness.

Which made it a wonderful thing whenever we encountered anyone with the sparkle of actual interest, regardless of how morbid it might be. We fell in with a very alert young physicist from Xerox PARC one evening. He had little good to say about most of what he had seen but at least gave evidence of involvement with it.

The second night we ran into a couple of mathematicians from Autodesk whom I had barely met at the Hackers Conference. In this context, we greeted one another like separated twins. Like the physicist, they told us of The One Truly New Thing. In their description, it had a mythic quality. It would be hard to find...its location was difficult to describe. We would have to look hard.

They were right. We tramped the backwaters of the Hilton Exhibit Hall for hours before coming on it. There it was: the magic eyepiece, The Private Eye. The invention of a fellow from Cambridge named Al Becker, it provides the first heads-up display for people who are not flying supersonic killer jets. Hanging from a headset about two inches from one's left cheekbone, the tiny screen projects a virtual display into the middle distance. With it, you could probably operate a computer while doing about anything short of sleeping or making love.

The potential applications of this gizmo are limited only by the imagination, but, at the very least, it looks like a good way of getting people out of the office. Interestingly, Becker created it without any application in mind, hoping to inspire rather than meet the expectations of a market.

He had come to COMDEX in search of 100 people or companies who could imagine a truly interesting use for it. If you came up with a good idea, you would get a development prototype for next to nothing. If you didn't, you could be IBM and you still wouldn't get one.

Becker clearly had a unique sense of what he was doing. He had previously co-founded a couple of companies, Kurzweil and Cadmus, from each of which he had taken leave as soon as they became institutions. He actually seemed to like making ideas happen as much as he liked making money.

If there were more people in the computer business like Al Becker, COMDEX would be a very different experience.

Breakfast with Big Blue

Dawns my second day of COMDEX. Out on Convention Center Way, the suits are streaming eastward toward the hovering saucer of the Convention Center as though returning to the Mother Ship. This vision, combined with their regularity of gait and dispassion of expression, wedges me right into a remake of *Invasion of the Body Snatchers* before I've even had a chance to wake up.

I'm starting to feel what Dr. Thompson called "bad craziness." In the hope of restoring internal order as well as lowering my profile, I put on a tie. We are, after all, going to the IBM breakfast. Where craziness of whatever sort will be about as welcome as anti-matter.

By some miracle, we get a cab to the Tropicana. There IBM has rented for us a breakfast nook only a little larger than a football field. As soon as the guards admit the gathered hordes, a sound system the wattage of which approximates the Grateful Dead's starts lathering us with synth-pop at a decibel level guaranteed to eliminate idle chatter.

This continues through breakfast. Which is a pity since I really want to hear what the IBM employees at our table are shouting at each other. Close up, they don't seem so much like cyborgs. I want to know them as humans.

Finally the Main Event begins. The lights are doused, the "music" swells, and suddenly the room is a cat's cradle of stabbing laser beams. To my complete astonishment, staid old IBM puts on a *son et lumiére* display which would have caused a less composed acidhead to faint with joy. The only thing I've ever seen like it was Captain Eo at Disneyland. It is a triumph of imagination, and I fully expect the crowd to head for the doors as though fire had broken out.

But they don't. They're captivated. When it's over, they hoot and whistle like a bunch of adolescents. I realize suddenly that businessmen hunger for imaginative daring as much as I do...they're just afraid to invest in it as individuals. Schooled up like this, and taken by surprise, they embrace it at once.

Unfortunately, the light show will be their last taste of it for the morning. Incredibly Big Management has a batting order of power speakers ready to whip us into a frenzy over Micro Channel architecture, OS/2, and SAA.

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The lead was George Conrades, IBM's V.P. of Marketing. In a fairly short speech, he used the words "strong," "stronger," or "strongest" 27 times by my rough count. These combined with the frequent use of words like "aggressive," "driven," "optimize," and "strategize," the practice of hurling consonants like darts, and an abundance of military metaphors to make it a vividly virile performance. That he pitched it to the management class was evident in the use of such magnificently bureaucratic neologisms as "solutioning."

But as far as I could tell, his style contained most of the content. The only thing he said which sounded like news to me was his characterization of IBM's mainframes as "super servers" for the PS/2 line, which, if indicative of IBM's new world-view, is one of the all-time great cases of a tail wagging a dog.

Though microcomputers still account for less than 7% of IBM's $50+ billion annual gross, the breakfast made it clear that they are taken very seriously. The folks in the Entry Systems Division, IBM's odd name for their microcomputer group, are no longer the "wild ducks of Boca Raton."

Don Estridge, the visionary computer hero who created the PC, is long dead, and in his place we have Bill Lowe, who the *Wall Street Journal* once characterized as "an old-style IBM man," noting nastily that "his wooden public image has prompted some critics to dub him the Gerald Ford of the industry."

Hey, Gerry Ford was at least funny sometimes. Bill Lowe, both in his speech and in the following press conference, most assuredly was not. Neither were the ubiquitous Bill Gates (who gave another demo of the whiz-bang new graphical user interface), David House of Intel, or Enzo Torresi of Businessland.

Not that they should bear any comic obligation. It's just that I regard the complete absence of wit to be the first and most pervasive symptom of totalitarianism. Whenever I find myself in a place which is completely barren of humor, I start looking around for evidence of thought control.

And the IBM breakfast was a wonderland of manipulated reality. Whether they were talking about the massive and enthusiastic acceptance of both OS/2 and the MicroChannel, or dismissing the threat of the Gang of Nine's EISA, or refusing to even admit the existence of the Macintosh, these were people who were able to describe a nonexistent world with as much sincerity as anyone in *1984.*

Indeed, the freebooters among them can slip seamlessly from one reality to the next without missing a beat. It was a very different world that Gates described when he addressed Macworld Boston last summer. And I would imagine that Torresi sings another tune for a breakfast laid out by, say, Compaq.

I would be less concerned if I thought their inconsistencies were conscious lies. Rather they are adapting to an environment of consciousness where such fixities as The Truth simply don't exist.

Threat or Menace?

We are very proud of our freedoms in America, and yet most of us now work in corporate environments which restrict, distort, and confine our thoughts, words and actions as rigidly as any communist regime. We exercise little choice in what we wear to work, where we live, what we say out loud, and finally, by habit, what we think to be true.

But wait, you'll protest, they'll shoot you in Russia if you don't go along. Naaah. They pretty much quit that years ago. The consequences of free expression in the Soviet Union are much the same as they are here: disenfranchisement and loss of economic security.

Bureaucracy is bureaucracy is bureaucracy and it doesn't make a damned bit of difference what sort of ideology it adorns itself with. It is always a machine in which people are interchangeable parts and must behave accordingly. Small computers, rather than restoring individual creation, have become corporate "productivity tools," as much the means of dominating both individuals and information as were mainframes.

COMDEX gave me a vision of the future which would make the movie Brazil look like a day at the beach. I saw an economy based on bureaucracy, every mother's son a "knowledge worker."

Most manufacturing will be devoted to electronically automating bureaucratic functions. The mountains of meaningless data will require desktop storage devices with capacities measured in terabytes. All real creation will cease and Americans would devote themselves to an endless loop of office supply.

Everyone will wear a blue suit, stare all day into a CRT, give occasional power speeches to mask his cultural emasculation, suppress whatever errant ideas break through, live in Marriotts and secretly know that he is doing nothing useful at all. Meaning will be replaced entirely by job security. Production will be measured by data shuffled. No one will have any idea what the truth might be about anything. And laughter will get you fired.

COMDEX made me think that such a world might, like IBM, be "Right for Today, Ready for Tomorrow."

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June 1992
Matthew's Farewell To The Amiga

We could always be sure of a storm of protest if anybody spoke ill of the Amiga in our pages. From the beginning, the community of Amiga users has made Mac zealots look anemic in their devotion to the machine.

As we go to press, Commodore's assets are being liquidated, and Amiga users, their passion unabated, hope for a benign buyout of Amiga technology by someone who can affort to give it the resources it's always deserved.

No doubt many books will be written on the downfall of Commodore, which, as one writer bitterly observed, once owned the personal computer industry with the C64. Blame allocation will no doubt be lavish and varied. What's beyond doubt is the fact that you can have great technology and customers whose loyalty most of the industry would kill for, and it's not enough.

Matthew's Farewell to the Amiga
A Great Machine in Search of a Great Company

By Matthew Leeds

Those of you who read the entire magazine may have noticed that in the last year or two I've been writing more than just this column, and that most of the other writing has not been about the Amiga. Those of you who only read this column, bless you.

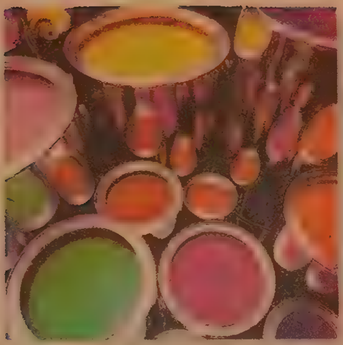
This will be my last regular Amiga column. While I've written my columns in the past for my readers, this one's for me. I hope you'll read it.

I'll still be contributing to *MicroTimes*, writing reviews, articles on multimedia, video, new technologies, and other stuff that catches my interest. But after seven years of nonstop coverage of the Amiga (the longest continuous coverage outside of *AmigaWorld*), it's time for me to move on.

The Unfulfilled Promise

I started writing about the Amiga because it was the most exciting computer available. Priced so that anyone could buy one, with a true multitasking operating system, incredible animation capabilities, lots of color, great sound, and other features considered radical in 1985 when it was released. Over the years I felt privileged to write about new products, new developments, and the future of the Amiga.

I switched careers, from photography to software, hoping to do my part to make the Amiga a success. It was a heady time, traveling across the country to



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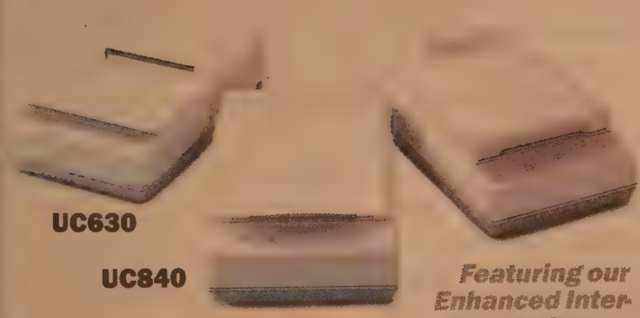

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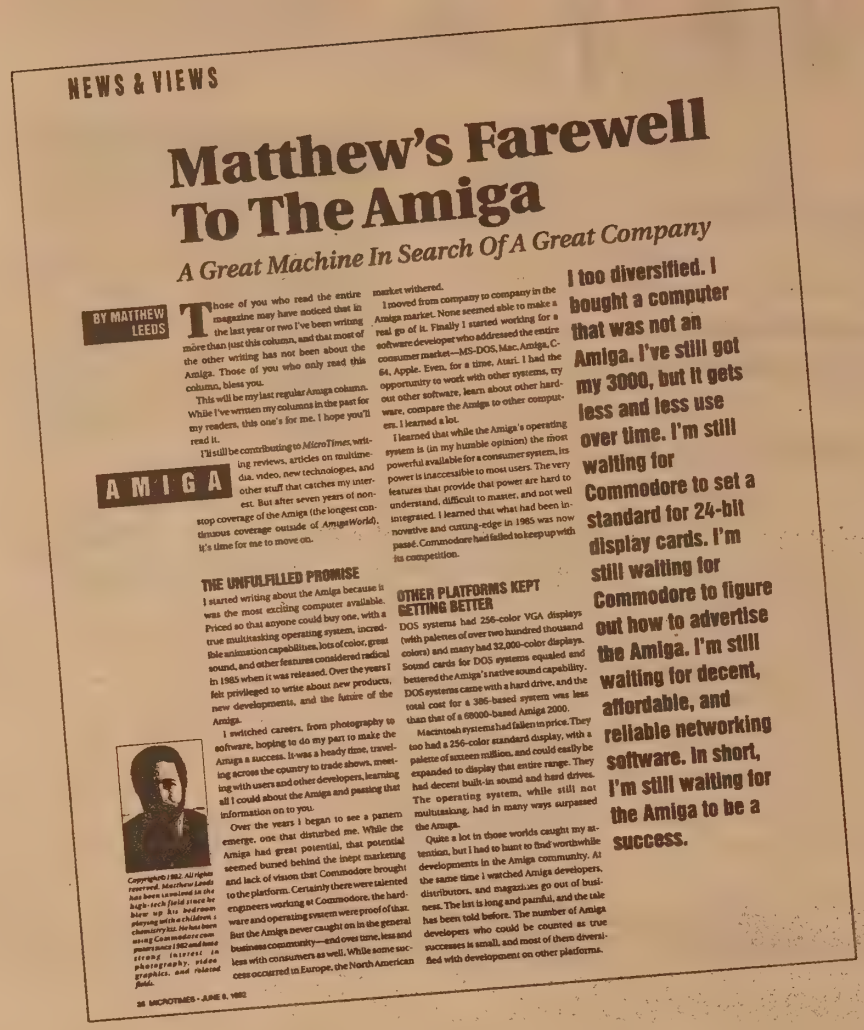

NEWS & VIEWS

Matthew's Farewell To The Amiga

A Great Machine In Search Of A Great Company

BY MATTHEW LEEDS

AMIGA

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I switched careers, from photography to software, hoping to do my part to make the Amiga a success. It was a heady time, traveling across the country to trade shows, meeting with users and other developers, learning all I could about the Amiga and passing that information on to you.

Over the years I began to see a pattern emerge, one that disturbed me. While the Amiga had great potential, that potential seemed buried behind the inept marketing and lack of vision that Commodore brought to the platform. Certainly there were talented engineers working at Commodore, the hardware and operating system were proof of that. But the Amiga never caught on in the general business community—and over time, less and less with consumers as well. While some success occurred in Europe, the North American market withered.

I moved from company to company in the Amiga market. None seemed able to make a real go of it. Finally I started working for a software developer who addressed the entire consumer market—MS-DOS, Mac, Amiga, C-64, Apple. Even, for a time, Atari. I had the opportunity to work with other systems, try out other software, learn about other hardware, compare the Amiga to other computers. I learned a lot.

I learned that while the Amiga's operating system is (in my humble opinion) the most powerful available for a consumer system, its power is inaccessible to most users. The very features that provide that power are hard to understand, difficult to master, and not well integrated. I learned that what had been innovative and cutting-edge in 1985 was now passé. Commodore had failed to keep up with its competition.

OTHER PLATFORMS KEPT GETTING BETTER

DOS systems had 256-color VGA displays (with palettes of over two hundred thousand colors) and many had 32,000-color displays. Sound cards for DOS systems equaled and bettered the Amiga's native sound capability. DOS systems came with a hard drive, and the total cost for a 386-based system was less than that of a 68000-based Amiga 2000.

Macintosh systems had fallen in price. They too had a 256-color standard display, with a palette of sixteen million, and could easily be expanded to display that entire range. They had decent built-in sound and hard drives. The operating system, while still not multitasking, had in many ways surpassed the Amiga.

Quite a lot in those worlds caught my attention, but I had to hunt to find worthwhile developments in the Amiga community. At the same time I watched Amiga developers, distributors, and magazines go out of business. The list is long and painful, and the tale has been told before. The number of Amiga developers who could be counted as true successes is small, and most of them diversified with development on other platforms.

I too diversified. I bought a computer that was not an Amiga. I've still got my 3000, but it gets less and less use over time. I'm still waiting for Commodore to set a standard for 24-bit display cards. I'm still waiting for Commodore to figure out how to advertise the Amiga. I'm still waiting for decent, affordable, and reliable networking software. In short, I'm still waiting for the Amiga to be a success.

Copyright© 1992. All rights reserved. Matthew Leeds has been involved in the high-tech field since he blew up his bedroom playing with a children's chemistry kit. He has been using Commodore computers since 1982 and has a strong interest in photography, video graphics, and related fields.

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And so I too diversified. I bought a computer that was not an Amiga. I've still got my 3000, but it gets less and less use over time. I'm still waiting for Commodore to set a standard for 24-bit display cards. I would not consider buying one unless I felt confident that most of the future software would run on it. I'm still waiting for Commodore to figure out how to advertise the Amiga; perhaps if they do, the installed base will expand sufficiently to encourage more broad-based software development. I'm still waiting for decent, affordable, and reliable networking software for the Amiga, so that it has a chance in the business community. In short, I'm still waiting for the Amiga to be a success.

Thanks and Anti-Thanks

I lay the blame for the Amiga's lack of success directly at Commodore's door. Perhaps revolving door would be a more apt description. Since I've been covering the Amiga, the long lists of presidents, vice presidents, public relations firms, advertising firms, and assorted marketing flacks that have passed through Commodore is impressive and depressing. The market positioning for the Amiga product line has changed more often than a one-year-old's diaper. The pricing on Amigas has changed more than the hemlines on skirts, and in as many directions. Commodore, get a grip.

There are a lot of people I've got to thank for helping me with my writing career. Roger Tierce and Malcolm Lowe and the rest of the gang from the San Francisco Commodore User's Group for taking me under their collective wing when I was just starting, and for that great run we made at promoting Commodore computers, the West Coast Commodore Association—the first West Coast Commodore-specific trade show promoters. Guy Wright for letting me write for *AmigaWorld*, and Bob Kinney for putting me on staff for a year at *Commodore Magazine*, may it rest in peace. Mary Eisenhart, my editor here, for letting a brash young know-it-all talk her into a regular column for Commodore computers, and for giving me virtual *carte blanche* as to content. All the guys that put the First Amiga User's Group together, and brought the spirit and excitement of those early years to so many. The engineers at Commodore who still haven't given up. The developers who created some of the most innovative hardware and software (here's hoping you all get the success you so richly deserve).

The Amiga has made an impact in the video market. A great portion of that success goes to one company, NewTek. For those of you interested in things Toasted, I recommend the *Video Toaster User* magazine, published by Avid Publications. They cover more than just Toaster-related products and do a great job on video and animation as well. I also recommend the *AmigaWorld Special Issue on Video & Animation*. While *AmigaWorld* often misses the mark, this issue is right on the money.

Finally I'd like to thank you for being a great audience for this column over the years. I hope that you've gotten as much enjoyment out of it as I have. ■

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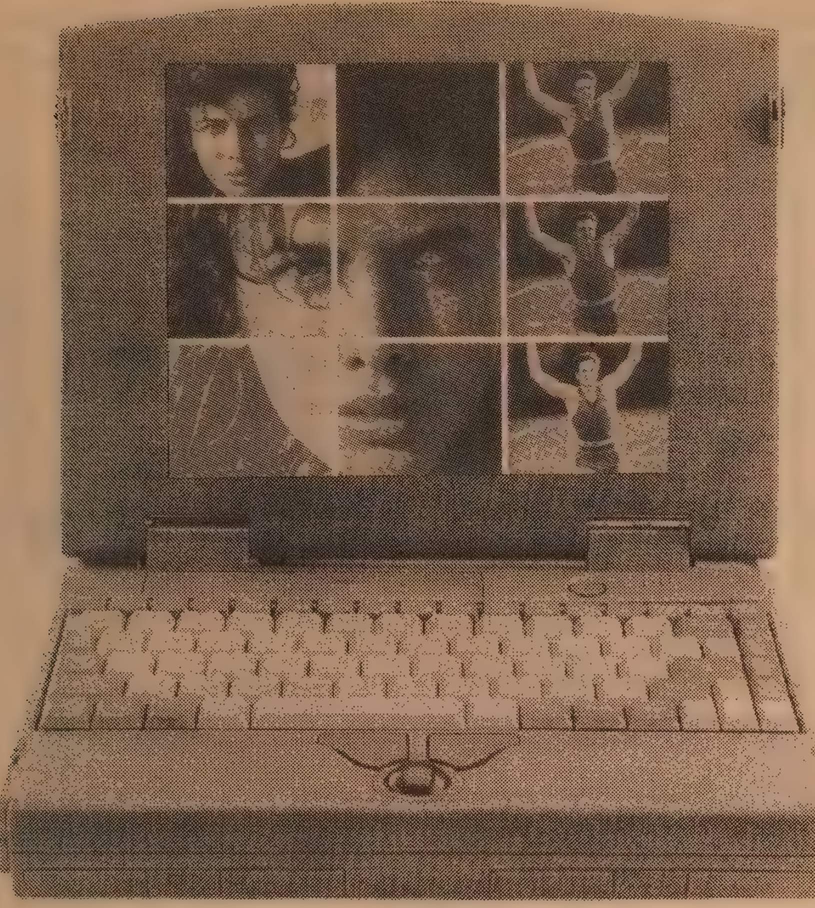

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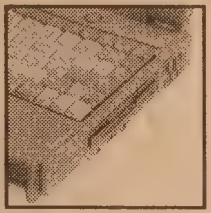

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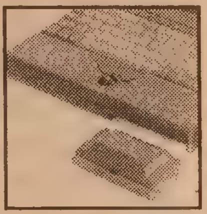

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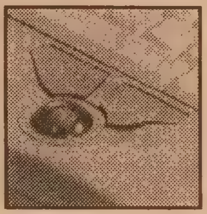

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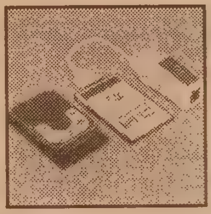

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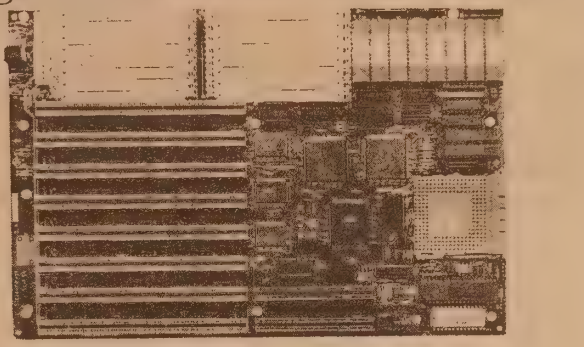

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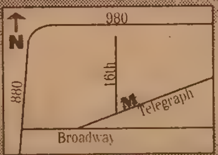

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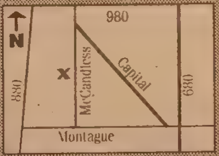

Updating A 386

Case History: Bringing An Old PC Up To Speed

By Ed Kahn

It doesn't seem like that long ago.

I remember making the decision to buy my new 386. I studied the options and decided on a generic 80386 computer with 4MB of RAM, a 60MB hard drive, an 80387 math coprocessor, and a tape backup. After all, my 60MB hard drive was just too big to back up onto floppies. I decided that 20MHz would be fast enough for me. After all, my primary task is writing and I could still do all of the other things I might need to do and check out the software that comes my way.

I loved the box. It was fast and let me run DESQview, my multitasking program that allowed me to switch back and forth between tasks with the push of a few keys.

The system was great, but time moves on. Eventually I was dragged kicking and screaming into the world of Windows. If I wanted to keep current with new programs, I could no longer resist the Windows environment, even though it was slower than my old setup.

Now, it's a few years later and I'm firmly in the Windows camp. I've gradually upgraded my system; when my old hard drive failed, I switched over to a larger drive. But despite all of the little changes I made over the years, I was still experiencing inordinate delays in my work for reasons I couldn't quite figure out. Eventually, I decided it was time to find the bottleneck and remove it.

Cyrix's Single-Chip Upgrade

My first decision was to use Cyrix's new 386 to 486 CPU replacement. I was excited when I first read about the chip, for it meant that I could upgrade to a 486 without replacing the whole system.

Prices vary, but for a 386DX, prices start at $299 list for a 16MHz system and go to $399 for a 25MHz replacement. Currently, there are replacement chips for DX systems running from 16MHz to 33MHz. SX replacement chips are available for machines running from 16MHz to 25MHz, and list prices range from $269 to $299.

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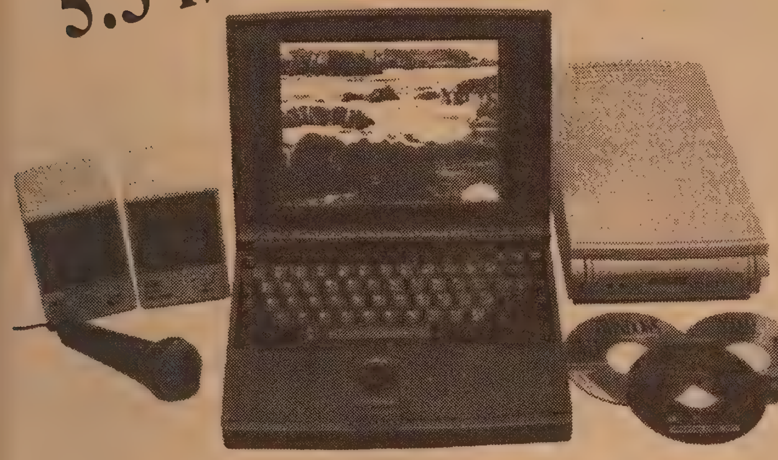

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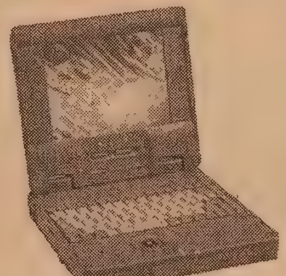

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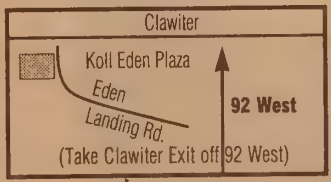

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Upgrading A 386...

The DX replacement chips will work in virtually any 386 machine. The SX replacement, however, will work only in machines made after about 1991; the Cyrix chip has to be installed on top of the 386SX chip because these chips are soldered onto the motherboard and are not removable.

Installation of the DX chip is simple. Cyrix claims that you can upgrade the system in fifteen minutes, and I found it to be so. It's as simple as removing the 386 chip with the tool they provide and replacing it with the new Cx486DRx^2. Then software is installed to invoke the cache, and you're done. Nothing could be simpler.

After making the swap, my Norton benchmarks indeed indicated that the machine had a 486 CPU and that my old 20MHz system was now running at close to 50MHz. When I ran the benchmark test within Windows, however, the improvement was not nearly as dramatic. The chip improved the speed considerably, but Windows does things that make the speed fluctuate between a higher and lower speed. This, I believe, is due to the nature of Windows, not the Cyrix chip.

Memory Issues

Although I'd upgraded my system to a 486, I didn't see the kind of improvement I had hoped for. First, it still took quite a while for my system to boot. That, of course, is due in part to my hard drive access time, as all of the data has to be transferred from the hard drive into RAM. Within applications like Excel, for example, there was a noticeable improvement in performance; however, the system was not as fast as I wanted.

As I began to make inquiries, I learned that there were two things that would make a dramatic difference. The first was to increase my memory to 8MB. The second was to make sure I had cache memory on the motherboard.

Unfortunately, when I purchased my original system, I didn't think it necessary to spend the extra money for onboard cache memory. I guessed right about my needs when running under DOS, but now that I was using Windows, I needed more. The bottleneck now appeared to be a lack of cache memory, and I simply couldn't add that to my system.

I could add RAM, but my motherboard was old. It would not accommodate onboard cache memory, and it showed a few other signs of aging. First, the 4MB that I did have were SIPP memory chips, a configuration that is no longer used in modern computers; it made no sense to spend more money for memory I wouldn't be able to use in a new system. Secondly, modern motherboards have a couple of slots into which you can insert VESA local bus cards, which are touted as greatly improving performance, especially for video and controller cards.

I phoned around and finally went back to my original vendor, HiQ Computers, from whom I had purchased my 386 system. They recommended I install a new motherboard that would use my Cyrix 486 processor and my old math coprocessor. Their VL-3486EP board sells for $139 and includes 128K of internal cache memory and two VLB slots. For another $30 they will install the board. I found this board met my needs to perfection. I could use my 486 and 387 chips and install up to 32MB of RAM. I put in 8 MB.

A number of excellent motherboards are available, but this model has several features I like, particularly its ability to take either a 386 or a 486 chip. What that means is that if I decide to upgrade my processor to a faster chip in the future—and lots of super fast CPUs are coming to market—I won't have to change the motherboard again. Also, this motherboard will accommodate any speed processor by merely changing jumpers, which means more flexibility for future changes.

After adding onboard cache as well as system memory, I noticed a dramatic change in performance. I wanted to know how much of the change was due to the addition of onboard cache memory and how much was due to the increase in RAM. I tried one and then the other and then both.

Indeed, each of these components contributed dramatically to the difference in performance. I boot up my system with three applications in the startup window. Before the changes, my system took nearly a minute and a half to load Windows and the applications. After the

continued on page 244

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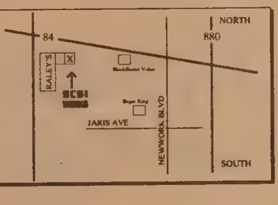

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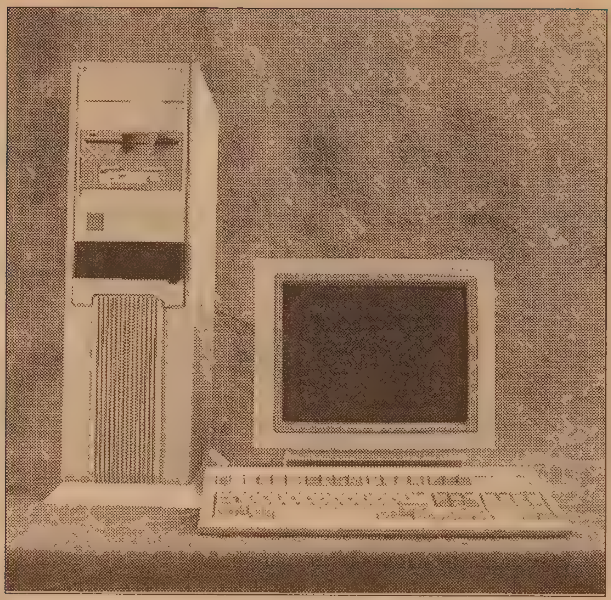

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- Dual media floppy drive
- VLB IDE HD/FD controller
- 2 serial, 1 parallel & 1 game port
- Medium tower case
- 101-key enhanced keyboard
- 1 year parts and labor warranty

$1899

Monitors

NEC				
SVGA	14"	1024x768	.28	$299.00
3V	15"	1024x768	60Hz	$469.00
3FGe	15"	1024x768	60Hz	$529.00
4FGe	15"	1024x768	72Hz	$629.00
5FGe	17"	1024x768	76Hz	$1039.00
5FGp	17"	1280x1024	74Hz	$1129.00
IMPRESSION				
3428	24"	1280x1024	.28	$259.00
3472N	14"	1024x768	72 Hz	$299.00
EPSON				
14"		1024v768	.28	$249.00
15"	1024x768			$459.00

Pentium PCI

- Pentium PCI Motherboard
- 16MB RAM expandable to 128MB
- Intel Pentium 60MHz processor
- 512K Cache memory
- 3 32-bit PCI expansion slots
- Dual media floppy drive
- PCI SCSI controller
- 2 serial, 1 parallel & 1 game port
- Medium tower case
- 101-key enhanced keyboard
- 1 year parts and labor warranty

$1999

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Sat - Sun: 10 - 5
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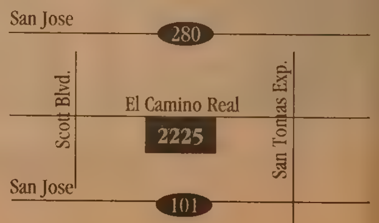

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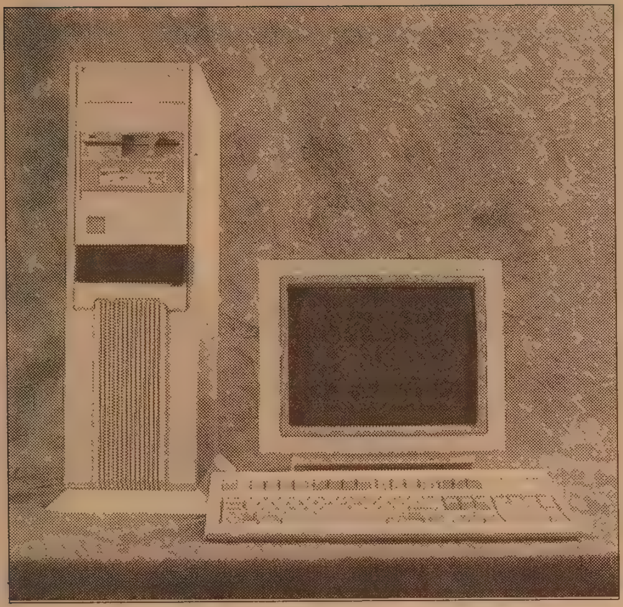

90MHz Pentium PCI/VLB

- Pentium PCI Motherboard
- 16MB RAM expandable to 128MB
- Intel Pentium 90MHz processor
- 512K Cache memory
- Dual media floppy drive
- 4 PCI, 2 VLB, 5 ISA slots
- PCI SCSI Controller card
- 2 serial, 1 parallel & 1 game port
- Medium tower case
- 101-key enhanced keyboard
- 1 year parts and labor warranty

$2369

Controllers

BUSLOGIC		
BT445S	VLB SCSI Controller Kit	$299.00
BT542	ISA SCSI-II Controller Kit	$269.00
ADAPTEC		
1542C	16-bit SCSI-II Controller Kit	$199.00
1542C+	SCSI-II w/ Corel SCSI	$249.0
SIIG		
ISA IDE	I/O with 2 16550	$69.00
AT	2S1P1G Multi I/O	$34.99
VLB IDE	2S/1P/1G w/ 16550 Bi-Dir	$55.00
VLB IDE	2S/1P/1G controller	$29.99
PCI IDE	I/O Controller	$39.00

90MHz Pentium VLB

- Pentium PCI Motherboard
- 16MB RAM expandable to 128MB
- Intel Pentium 90MHz processor
- 512K Cache memory
- Dual media floppy drive
- 3 VLB, 5 ISA slots
- VLB IDE Controller card
- 2 serial, 1 parallel & 1 game port
- Medium tower case
- 101-key enhanced keyboard
- 1 year parts and labor warranty

$2299

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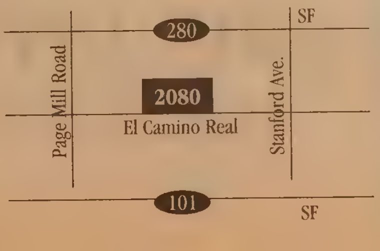

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Complete & Affordable Systems

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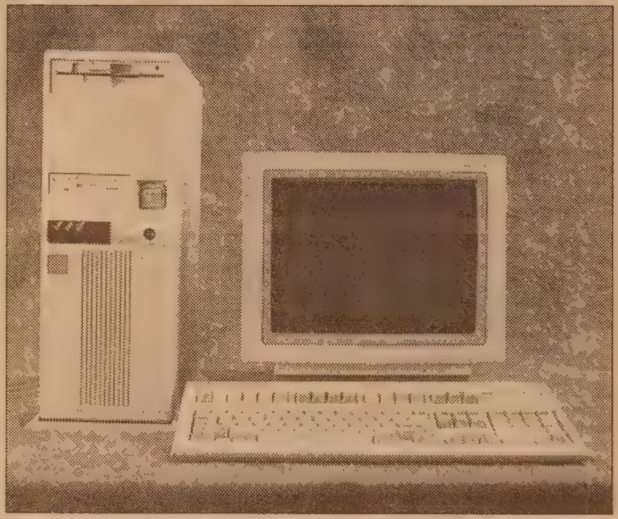

GREEN 486DX-33 VLB

- 486DX-33MHz processor
- 256K Cache memory
- 4MB RAM expandable to 32MB
- Quantum 270MB IDE hard drive
- 2 VLB expansions slots
- Dual floppy drive
- VLB IDE HD/FD controller with 2 S, 1P & 1 G port
- Trident 9200 VLB SVGA card
- 14" Impression SVGA monitor
- Medium Tower case
- 101-key enhanced keyboard
- 1 year parts & labor warranty

$1269

Hard Drives

CONNER			
213MB	CF210A	14ms	$199.00
340MB	CFA340A	13ms	$259.00
420MB	CFA420A	12ms	$269.00
MAXTOR			
340MB	7345A	14ms	$269.00
540MB	MXT540A	8.5ms	$385.00
540MB	MXT540S	SCSI	$449.00
QUANTUM			
120MB	LPS120A		$169.00
170MB	LPS170A		$179.00
270MB	LPS270A		$229.00
340MB	LPS340A		$249.00
540MB	LPS540AT	3.5x1	$379.00
540MB	LPS540S	SCSI	$399.00
1.08GB	PD1080S	SCSI II	$729.00
1.8GB	PD1800S	SCSI	$999.00

Motherboards

386DX-40MHz	$199.00
486	
DX33 with 64K Cache	$59.00
DX50 with 256K Cache	$99.00
Green DX33 VLB with 256K	$129.00
ALI Green PCI/VLB with 256K	$189.00
PENTIUM w/ 512K Cache	
66MHz VLB	$339.00
66MHz PCI	$429.00
90MHz VLB/ISA	$499.00
90MHz PCI/VLB	$499.00

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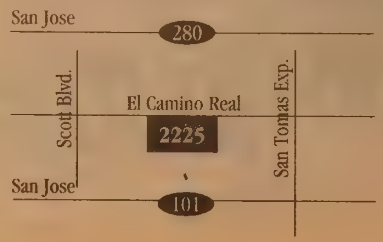
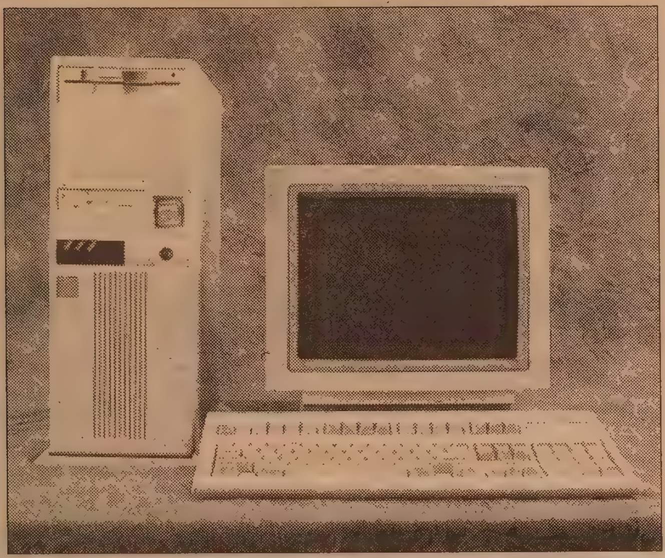


Provider of Top Quality Products!

486 VESA LOCAL BUS SYSTEMS



Green VESA Local Bus

- Green VLB Motherboard
- 4MB RAM expandable to 32MB
- AMD DX2-66MHz processor
- 256K Cache memory
- 2 32-bit VLB expansion slots
- 3.5" 1.44MB floppy drive
- VLB IDE HD/FD controller
- 2 serial, 1 parallel & 1 game port
- Supports up to 32MB RAM
- Mid Tower w/ power supply
- 101-key enhanced keyboard

$777

Video Cards

DIAMOND		
Stealth 24	VLB, 1MB	$139.00
SpeedStar Pro	VLB, 1MB	$129.00
Viper VLB	2MB VRAM	$339.00
ORCHID		
Celsius	2MB VRAM VLB	$199.00
GENOA		
8500 VL Turbo	VLB 1MB	$109.00
MATROX		
MGA	PCI/2MB	$455.00
MGA	PCI/Plus 2MB	$535.00
Impression	3AH Pro	$735.00
Impression	3VH	$795.00
#9		
9GXe	Level 10 VLB, 1MB	$249.00
9GXe	Level 11, VLB, 2MB	$345.00
9GXe	Level 12, 3MB	$409.00

GENOA VESA Local Bus

- GENOA 486VL Motherboard
- 4MB RAM expandable to 32MB
- AMD DX2-66MHz processor
- 256K Cache memory
- 3 32-bit VLB expansion slots
- 3.5" 1.44MB floppy drive
- VLB IDE HD/FD controller
- 2 serial, 1 parallel & 1 game port
- Supports up to 32MB RAM
- Mid Tower with power supply
- 101-key enhanced keyboard

$799

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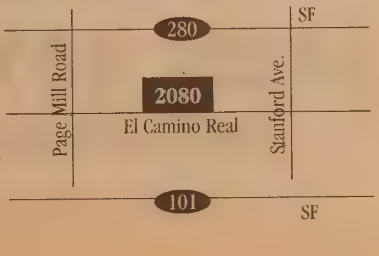

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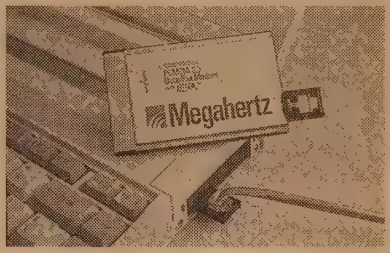
Authorized NEC Sales Center

Versa E Notebooks 486DX4-75 MHz

- i486DX4-75 MHz
- 4MB RAM Expandable to 20MB
- Removeable/Reversible Screen
- 340 MB Hard Drive
- 2 Type II PCMCIA Slots
- MS-DOS & Windows
- Front-Mounted Mouse

Color!

$5499



MEGA-DEAL... From Megahertz CORPORATION

$50 Instant Rebate*

for Megahertz XJ114 fax modem PCMCIA card

- Buy any notebook at Access or bring in any old Notebook or Pocket fax modem and receive $50 rebate for one Megahertz XJ1144 fax modem PCMCIA card

With Free Installation!

** Limit one per customer, no resellers*

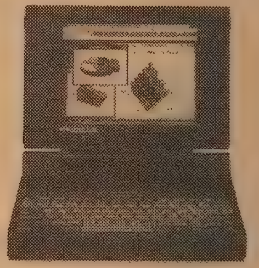
Versa E Notebooks 486DX2-50 MHz

- 486DX2-50MHz
- 4MB RAM expandable to 20
- Active matrix color LCD
- 209MB hard drive
- DOS and Windows pre-installed
- Front-Mounted Mouse

$4451

Color w/ 340MB HD	$4988
Mono w/ 209MB HD	$3248
Mono w/ 340MB HD	$3666

Versa E Notebooks 486DX2-40 MHz



- 486DX2-40MHz
- 4MB RAM expandable to 20
- Active matrix color LCD
- 250MB hard drive
- DOS and Windows pre-installed
- Front-Mounted Mouse

$4199

Mono w/ 250MB HD	$2955

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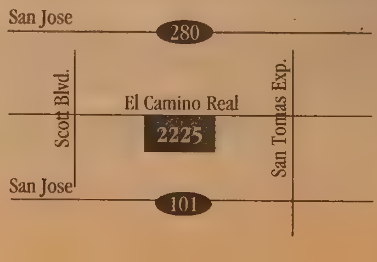

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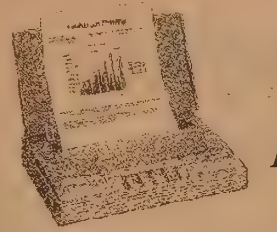


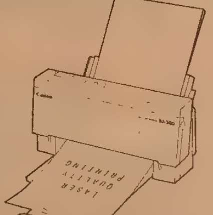
BJ-10sx Portable Bubble Jet Printer

**$30 Rebate

- Prints 30% faster than 10ex
- Weighs 10% lighter than 10ex
- Text graphics up to 360dpi
- Uses plain paper & transparencies
- 1 year warranty

$219**

BJ-200e Ink Jet Printer



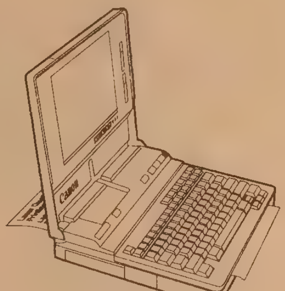
- 360dpi resolution
- Prints up to 248cps
- 100-page sheet feeder
- 7 resident fonts
- Hold up to 10 envelopes
- 2 Year Warranty

$269**

Wide Carriage (11x17) BJ-230 . . . . . $399

NoteJet 486 Notebook

Notebook and Printer All-in-One!



- 486SLC-25 MHz
- 4MB exp to 12
- 120MB HD
- Built-in BubbleJet Printer
- 2 PCMCIA II slots
- DOS, WIN, hand-held trackball

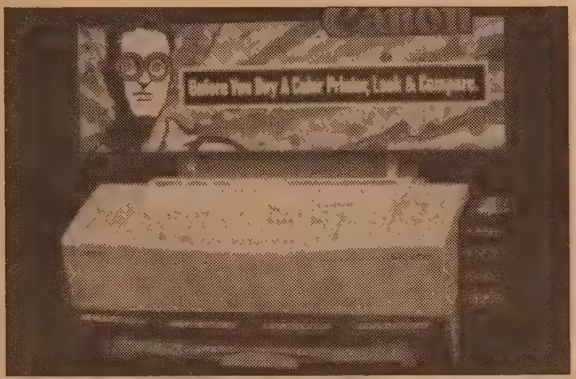
$2299

Color NoteJet

Color Notebook & Printer All-in-One

486SX-25	w/ 120MB HD	$2188
486SX-25	w/ 200MB HD	$3188

*** $30 end-user's rebate, 5-19-19 to 8-31-94*



BJC-600 Color Ink Jet Printer

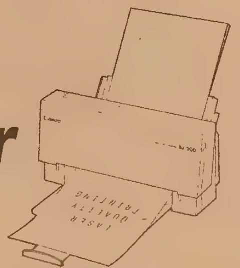
Prints Transparencies!

- 360 dpi
- 240cps draft, 170cps high quality
- 64 nozzles per color
- 16.7 million colors available
- 100-sheet ASF
- 2 year product warranty

Color!

Super Quality! **$558****

BJ-100 Inkjet Printer

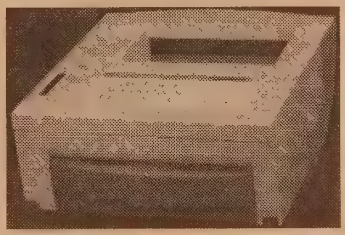


- 140cps, 120cps
- 360x360 resolution
- 64 nozzles print head
- 100 sheet paper tray

Affordable Printer

$239**

LBP-430 Laser Printer



- 4ppm
- 1MB expandable to 5
- PCL-5 emulation
- 22 fonts - 8 scalable
- 2 year limited warranty

$558**

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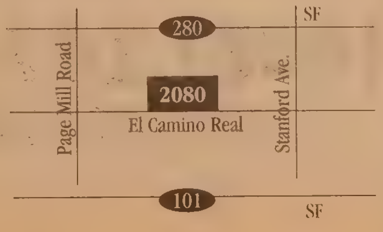

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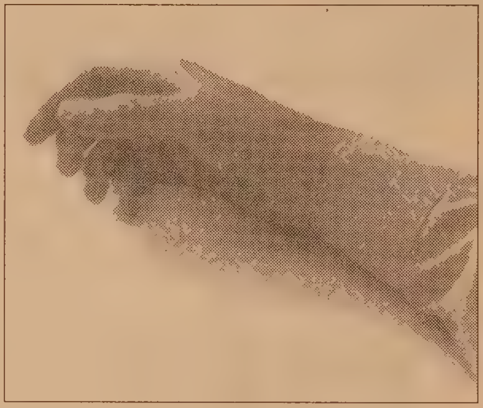
MS Mouse... only at ACCESS

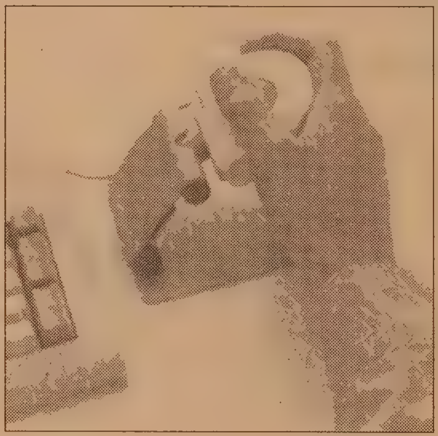
Now You Can Get this MS-Ballpoint Mouse ($169 MSRP) for $19.99 *Only at ACCESS COMPUTERS!*

Comfort...



The relaxed hand - the most natural, stress-free position your hand can take. Wouldn't it be great if you could work with your hand in this position? Well, now you can...

with the Desktop Stand for Microsoft Ballpoint

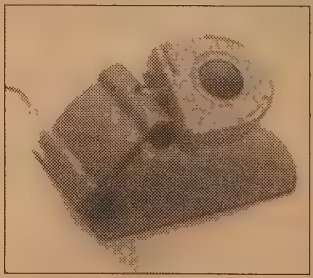


The Desktop stand is ergonomically designed to cradle the Ballpoint mouse and your hand. Its form fits it function. Whether you use the Ballpoint mouse in your right or left hand, and whether your hand is big or small (or somewhere in between), the desktop stand is right for you. It's fully adjustable and that means more comfort as you work.

Ready...

Tilt...

Swivel!



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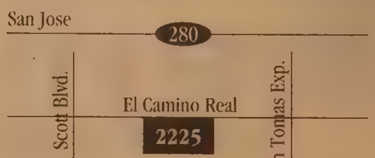

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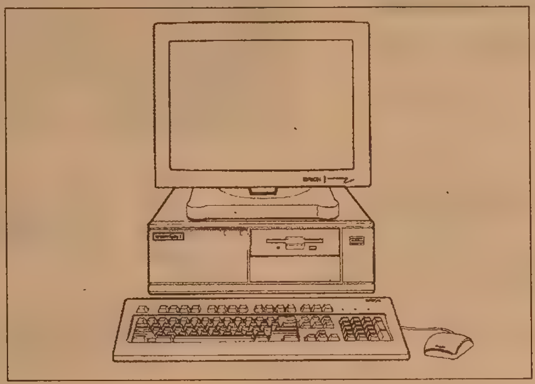
WHEN YOU'VE GOT AN EPSON,
YOU'VE GOT A LOT OF COMPANY™

EQUITY 4
486SX-25MHz

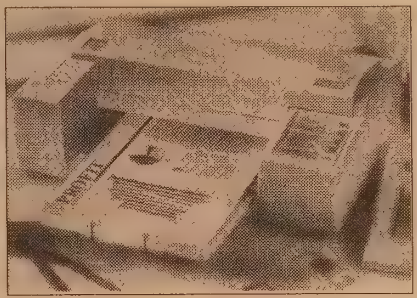


- 4MB RAM memory
- 120MB IDE Hard Drive
- Built-in SVGA Card
- ZIF Socket for future upgrade
- DOS, WIN, mouse and keyboard
- 1 year on-site warranty

$599

DX2-66 version................$899

STYLUS 800
Ink Jet Printer



- 150cps speed
- 360dpi resolution
- 100-sheet feeder
- 2 year warranty

$289

Stylus 300	$249
LQ-1070+/1170	$389/619
FX-1170	$369
ActionLaser 1500 6ppm, PCL5	$688
LQ5705	$249
FX 870	$289

ActionNote 500C Color Notebook

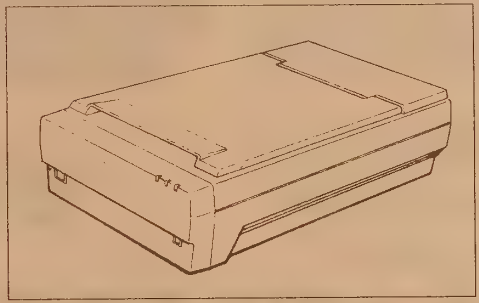
Color!

- 486 SLC-50MHz processor
- 4MB RAM expandable to 8MB
- 180MB IDE Hard Drive
- Passive matrix color display
- Built-in modem only
- 1 year road-site warranty

$1999

Mono w/ Fax Modem.........$1649

ActionScanning ES-600C



- 24-bit color, 8-bit greyscale
- Output 50-600dpi resolution
- Exclusive TruePass™ technology
- Built-in imaging procesing features:
  - brightness
  - gamma
  - color correction
- Available for PC or Mac

$795

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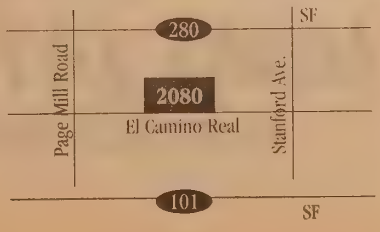

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Complete Computer Source

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NISSEI SANGYO AMERICA, LTD.

SuperScan™ Monitors

Elite 17
energy EPA POLLUTION PREVENTER
- 17" flat display
- 0.28mm dot pitch
- 1600x1200 max resolution
- 66Hz refresh rate at 1200

$1049

SuperScan 15s
energy EPA POLLUTION PREVENTER
- 15" flat square display
- 0.28mm dot pitch
- 1280x1024 max res.
- Vertical refresh rate 50-120Hz

$449

SuperScan Pro 20
energy EPA POLLUTION PREVENTER
- 20" dark bulb CRT
- 0.31mm dot pitch
- 1280x1024 max res.

$1588

ATI TECHNOLOGIES INC.
Perfecting the PC

Graphic Ultra Pro
- 2MB VRAM
- Non-interlaced 1280x1024
- Multiple Bus support
- 76-Hz flicker-free display

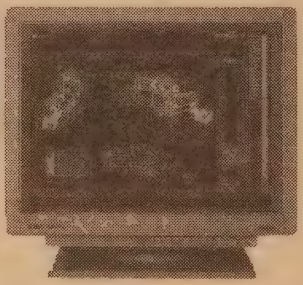
$299

Graphics Pro Turbo, 64-bit

2MB	VLB	$399
4MB	VLB	$599
4MB	PCI	$599

New!

NANAO



F550i
- 17" FlexScan
- 0.28mm dot pitch
- 1280x1024

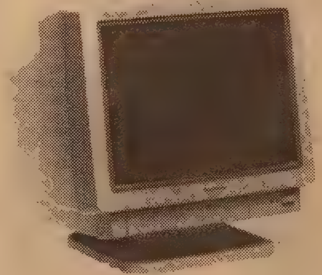
$899

MITSUBISHI
INTERNATIONAL CORPORATION

Diamond Pro 17"
- 17" SVGA
- 1024x768
- .26mm dot pitch

$899

Panasonic
Office Automation OA



PanaSync C1395
- 14" MultiSync
- 1024x768
- 0.28mm dot pitch

$229*

* Refurbished monitor

PanaSync Pro C1795E
Great Price!
- 17" SVGA
- 10280x1024
- 0.28mm dot pitch

$999

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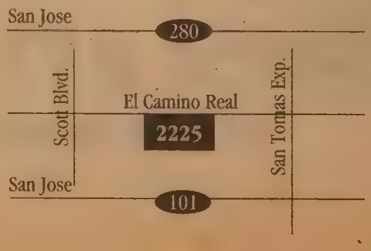


Complete Computer Peripherals Source

386DX-40

Motherboard
with
CPU

$88 AMA340C

Microsoft Mouse II

Ergonomical
Design Serial
Mouse

$39.99 PMS060T

14" Color VGA Monitor

by Abonite

$169

15" SVGA Monitor

Mac Adaptor
included
by Sigma Design

$299

96/24 External Modem

By Wang

$39 ADF92WE

3.5" Formatted Diskettes

Sold in boxes of 50

29¢ ea. XDM350

MX™

MX Stealth

14.4/14.4
Faxmodem with
Win Fax Software

$109 MTM17

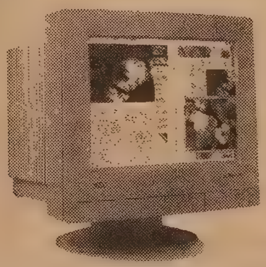
MX™

MX Lite

96/24
Pocket Fax with
Win Fax Software

$99 C1795E

NEC



MultiSync Monitor 3V

- 15", .28mm flat square CRT
- 1024x768 at up to 60Hz
- Energy Star compliance
- 3 year warranty

$469

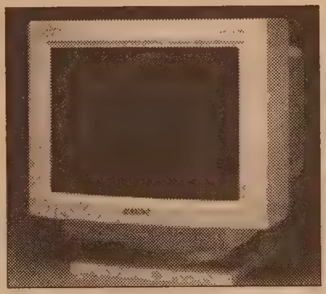
Professional Series

5FGp	17"	1024	.28	$1129.00
6FGp	20"	1280	.28	$1999.00

Business/Home Series

SVGA	14"	1024	.28		$299.00
3FGe	15"	1024	.28	60Hz	$529.00
4FGe	15"	1024	.28	76Hz	$629.00
5FGe	17"	1024	.28		$1039.00

SONY



IBM & Mac Compatible

GDM-17SE1

- 1600x1200 max resolution
- .25mm dot pitch
- 50-150Hz vertical scan range
- Energy Star compliant

$1050

CPD-1320	14"	640	.25	329.00
CPD-1730	17"	1024	.25	899.00

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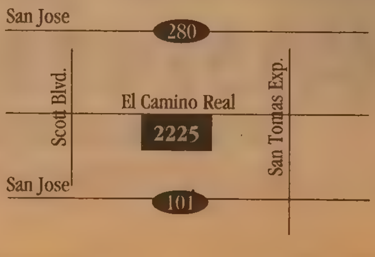

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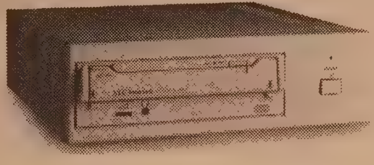

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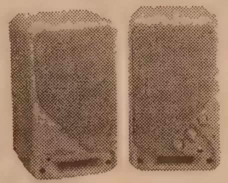

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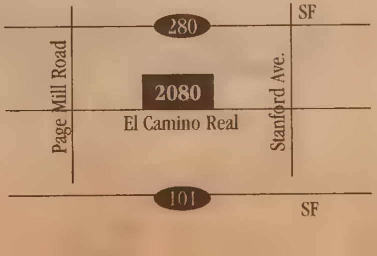

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Panasonic Office Automation OA

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KX-P2023	$199	KX-P4400	\$499^{95}
KX-P2123	$239	KX-P4440	$999
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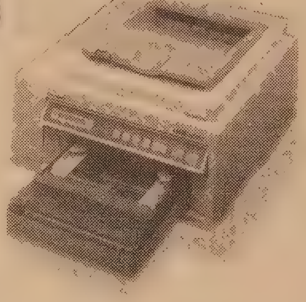
2nd Inventory - with original factory warranty

KX-P2123	$199	KX-P2124	$249

Panasonic

KX-P4410



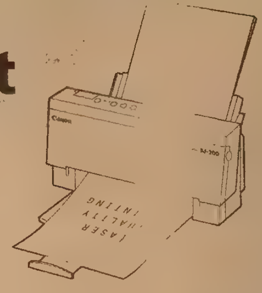
- 5 ppm
- HP IIP emulation
- 512K exp to 4.5MB
- 200-sheet multipurpose tray
- 1 year warranty

** 2nd Inventory Printer*

$449*

Canon

BJ-200 Ink Jet

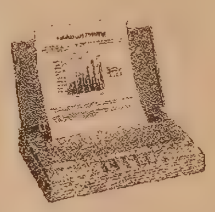


- Prints up to 248cps
- 100-sheet feeder
- Optional ASF
- 90-day Warranty

** Refurbished Printer*

$199*

Canon



BJ-10ex Portable Inkjet

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- Weighs only 4 lbs.
- 90-day Warranty

** Refurbished Printer*

$149*

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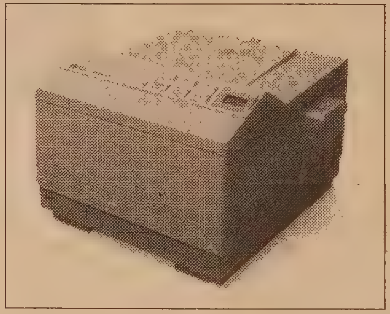

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- 32 shade Gray scale
- 48-digit LCD Display

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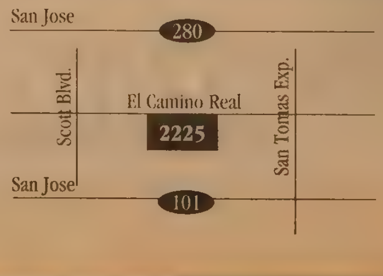

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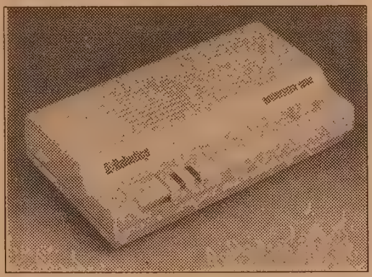

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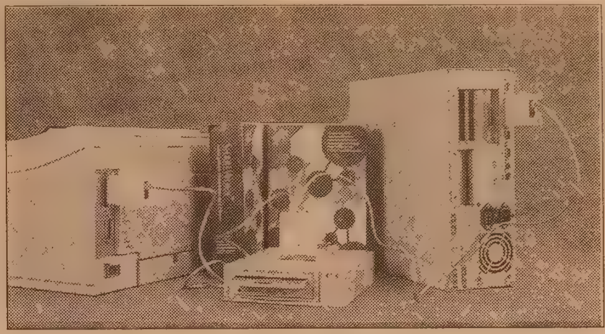

Share your printer? How about CDROM!

Your entire office can now share printers and SCSI peripherals without installing an expensive network. Just connect a ShareWork module to the parallel port of each computer and to each shared device - everyone gains access as if they were attached directly.

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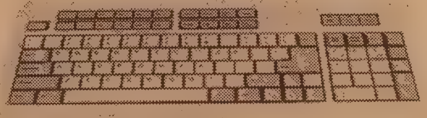

NMB 101 KB w/ PS/2 connector	15.00
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MITSUMI 101-key	29.00
FUJITSU 101-key 4700	59.00
SUNTOUCH ALPS 101-key	57.00
MAXISWITCH Nova 9200	29.00
FOCUS	
8000 101 Key W/Calculator	49.00
2001 101 Key W/Calculator	45.00
9000 129 Key W/Calculator, Programmable	69.00
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NOVELL

3.12 Version

5 users	$599	50 users	$2699
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3COM		
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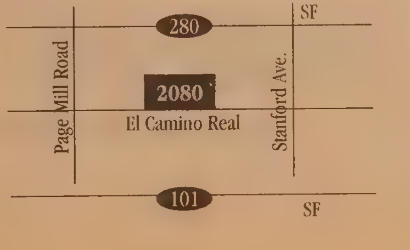

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Complete Printer Source Center

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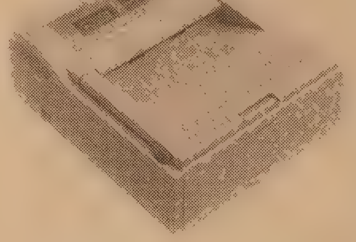

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- Dual Monitor Support
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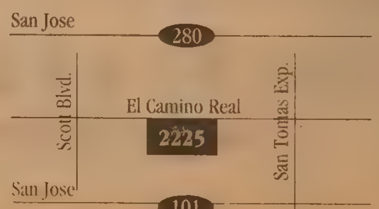

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Pariety

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CPU ***(Please call for CPU Prices!)***

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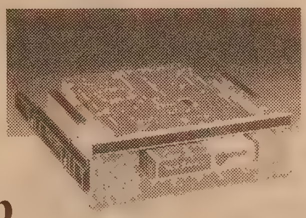

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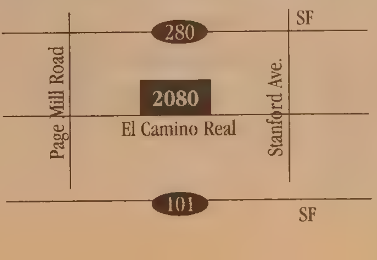

BMUG

Spring Follies

Plus: New Toys For Newton

BY DAVID MORGENSTERN

Spring is great.

The steady climb of the daily pollen levels is mirrored in the tidal action of my sinuses. The doors and windows are opened wide for the seasonal cleaning ritual. And there are the three spring "B"s—Baseball, BMUG, and Bombs.

The BMUG HelpLine is flooded with the calls from students of all ages caught in the end-of-semester crunch. These students unfortunately were absent from class when a vital lesson was covered. They don't know the simple rule: When you can't afford to lose a single word, you must religiously save your work! It's imperative to Save, and Save As regularly, even as often as every few minutes to really ensure that your best work will cross the teacher's desk.

Fortunately, BMUG keeps trying to make sure our best work flows from the sharing of information at meetings, on online services, and through terrific publications. Onward!

April Fool's Gold

The first of April is always a special day for computer maniacs. All around the Internet people post joke press releases, fake messages, and other foolishness. The best this year was a fake Apple Assistance Center newsletter from some unnamed author deep inside Apple.

The *AAC Bulletin* is an electronic publication that lets the telephone helpmeisters know what's going on around the campus. It covers everything from verified bug reports to new products that callers might ask about. It also makes sure that the Center communicates the official Apple-approved line on each and every Mac subject under the sun.

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Teleport Bronze II FaxModem	$109
Supra FaxModem v.32bis LC	$179
Teleport Gold v.32bis 14,400	$299
US Robotics Mac&Fax 14,400	$179

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NEC SilentWriter Model 640	$799
HP LaserJet 4MP w/ Cable •600dpi, 6MB RAM, Post Script II Laser	$1399
Deskwriter 560c w/ Cable •600 dpi Color Ink Jet Printer	$595
StyleWriter II, w/ Cable, *low price*	$299

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2 Meg Simms, 80ns	$99
4 Meg Simms, 80ns	$199
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16 Meg Simms, Quadra/PowerMac	$695
32 Meg Simms, Quadra/PowerMac	Call
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- 4-Mice Rating by MacUser Magazine
- Agfa Quality at low, low price

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- 10 bit per pixel, 30 bit, 1 billion colors
- Excellent for professional prepress & image editing
- Slides, transparencies and X-ray images supported
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Quadra 610 8MB/230/CD	**$2039**
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- We Buy or Trade Any Macintosh CPU (Mac SE minimum) & Peripherals

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Hard Disk Tool Kit PE Included

†External Unit Add $90 ea.

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Macintosh Rentals

Security Deposit Required

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$199	**$69**	**$159**	**$169**
Monthly	Monthly	Monthly	Monthly

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Apple Multiple Scan 17 Color Display	**$35/Mo**
Radius PrecisionColor Pivot	**$23/Mo**
Radius 20GS Monitor	**$32/Mo**
Thunder 24 Video Board--*Fastest 24 Bit*	**$61/Mo**
NEC Silentwriter 640, *New Low Rate*	**$30/Mo**
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Conner	250MB IDE/ 340MB IDE	$214/$254
	420MB IDE/ 540MB IDE	$274/$379
Fujitsu	520MB IDE	$409
	1GB SCSI	$749
Maxtor	131MB IDE/ 245MB IDE	$179/$229
	345MB IDE/ SCSI	$264/$339
	540MB IDE/ SCSI	$389/$469
Quantum	170MB IDE/ 270MB IDE	$189/$224
	340MB IDE/520MB IDE	$259/$394
	540MB SCSI/ 1GB SCSI	$489/$759
WD	250MB IDE/340MB IDE	$215/$259
	420MB IDE/540MB IDE	$289/$394

MONITORS

ADI		14" Microscan 3E NI	$ 269
		17" Microscan NI	$ 679
KFC		15" .28 1024x768 NI	$ 349
		17" .26 1280X1024 NI Flat Digital	$ 735
MAG	MX15F	15" .28 NI	$ 439
	MX17F	17" .26 NI Flat	$ 859
NANAO	F5501	17" .28 1280X1024	$ 939
	F5501W	17" .28 1280x1024	$1055
NEC		14" .28 1024X768 NI	$ 335
	3V	15" .28 NI Flat	$ 479
	3FGe	15" .28 NI Flat	$ 569
	4FGe	15" .28 NI Flat	$ 625
	5FGp	17" .28 NI Flat	$1129
	5FGe	17" .28 NI Flat	$ 995
	6FGp	20" .28 NI Flat	$1995
SONY	17SEI	17" .25 NI	$ 999
Viewsonic	VSC6E	14" .28 NI	$ 285
	VSC15e	15" .27 NI	$ 369
	VSC15	15" .27 NI	$ 449
	VSC17g	17" .28 NI	$ 799
	VSC17	17" .28 NI	$ 979
	VSC20	20" .28 NI	$1575

NETWORK

3COM	509 Etherlink III TP/ Coax	$114
Artisoft	Lantastic 6.0 Startki 2 Userst	$345
	Lantastic Add-on Kit Coax/TP	$169
	Lantastic Noderunner 2000/C,T	$175
Intel	Etherexpress 16 TP/ Coax	$ 99
Novell	Personal Netware	$ 75
	Netware 3.12 5 Users/10 Users	$ 605/$1375
	Netware 3.12 25 Users/50 Users	$1865/$2750
SMC	Elite Plus 16TP/Coax	$ 125
	Elite Ultra 16TP/Coax	$ 97

MODEMS

Intel	14.4 Fax Modem Int /Ext	$129/ $159
	Satisfaxton 400/400E	$279/ $315
	PCMCIA 14.4 Fax Modem	$289
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	Blaster AWE32	$279
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	Game Blaster CD 16 Kit	$389
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	Pro Audio Studio 16	$149
	Pro Movie Studio	$189
	Memphis	$589
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NEC	CDR-510 Triple Speed Int CD-ROM	$355
	3Xp Triple Speed Int/Ext CD-ROM	$449
	3Xi Triple Speed CD-ROM	$489
	3Xe Triple Speed CD-ROM	$559
Panasonic	562 Double Speed CD-ROM	$159
Texal	DM-3028 250MS Int CD-ROM	$279
Toshiba	3401B 200MS Int CD-ROM	$319
	3401E 200MS Ext CD-ROM	$419

CONTROLLERS

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	1522/ 1522K	SCSI	$ 79/$145
	1542C/1542CK	SCSI	$199/$209
	2842-VL	VLB/SCSI	$299
	2742TK	EISA/SCSI	$369
Buslogic	BT445S VLB/SCSI/ BT545S SCSI		$265/$209
	BT747AK	EISA/FAST SCSI	$389
Promise	DC200/DC420	IDE CACHE	$105/$109
	DC2040	SCSI CACHE	$159
	DC-4030VL	VLB/IDE CACHE	$119
Trantor	T130	SCSI	$ 65
	T338/T348	Parallel/SCSI	$109/$159
Ultrastor	34F	VESA/ SCSI	$199

TAPE BACK-UP

Colorado	DJ-10	120MB Int	$ 98
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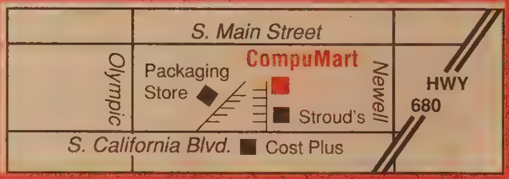
	Trakker	120MB/250MB Printer port	$279/329
HP	35480	DAT 4-8GB Int SCSI	$1079



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Citizen	GSX-230/ GSX-240	$245/ $ 285
	PN-48/ Notebook Printer II Color	$245/ $ 315
Cannon	BJ-10SX	$ 269
	BJ-200e/ BJ-600C Color	$299/ $ 610
Panasonic	KX-P2123/ KX-P2124	$249/ $ 339
HP	Deskjet 520/ 500C	$299/ $ 379
	Deskjet 560C/ 1200C	$589/ $1389

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	Laserjet 4/4M 8PPM, 600DPI	$1385/$1885
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Epson	Stylus 300/800	$ 269/$ 299
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Fargo	Color Printer	$ 739

SOFTWARE

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Corel	Corel Draw & CD for Windows V3	$129
Lotus	1-2-3 for Windows/4.0 Upgrade	$299/$ 97
	AmiPro for Windows Upgrade	$ 69
Microsoft	Excel V5.0 for Windows	$295
	Excel Upgrade/Trade Up	$ 89/ $119
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	Office Upgrade/Trade Up	$219/$265
	Word 6.0 for Windows/Trade Up	$125/ $289
	Word Upgrade/Trade Up	$ 89/ $125
	Visual Basic STD/PRO for Windows	$129/ $305
	Workgroup 3.11 ADD-ON	$ 47
WordPerfect	WordPerfect 6.0 for Windows	$269
	WordPerfect Upgrade/Trade Up	$105/$129

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HP	ScanJet IIP/ IICx	$ 529/$ 969
Logitech	Scanman 32	$ 105
	Scanman 256/ w OCR SW	$ 169/$ 199
	Scanman Color/ w OCR SW	$ 399/$ 459
Microtek	Scanmaker IIGS Flatbed Color 600DPI	$ 589
	Scanmaker IISP Flatbed Color 600DPI	$ 795
Tamarack	ARTI Color 600DPI Flatbed	$ 669

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Apple Introduces Power Macintosh 9900/200

By Loof Lirpa, Editor

On April 18, Apple will introduce the Power Macintosh 9900/200. Unfortunately, since the product will be discontinued on April 11, one week prior to introduction, no units will be available.

Had the Power Macintosh 9900/200 actually been introduced, it would have been the fastest personal computer available on the market today - with a 200-MHz PowerPC 901 chip, 1 Gigabyte of onboard DRAM, 8 Megabyte of VRAM and a 10 Gigabyte hard drive.

In the past, Apple's customers have voiced numerous complaints about products being discontinued shortly after introduction, thus rendering the product obsolete. Apple feels that by discontinuing products well in advance of introduction, this will no longer be an issue.

Impact On Apple Call Centers: Customers may call in to inquire where to obtain the Power Macintosh 9900/200.

Actions:

- **Explain** that the Power Macintosh 9900/200 was discontinued on April 1.
- **Log** any complaints customer may have.

20 Inch Multiscan Display Repair Program

By Keith Smith, Editor

All of the original 20" multiscan displays shipped with a problem wherein the screen image was badly tilted. This problem cannot be fixed by adjusting the monitor, as is normally the case.

On April 1, Apple announces the AppleShim program to address this problem.

Beginning immediately, customers can purchase the AppleShim Repair Kit. This kit consists of 4 small shims which may be conveniently placed under one edge of the monitor, fixing the problem. The kit is available for $29.95 from Authorized Service Providers.

Impact On Apple Call Centers: Customers may call seeking service on the above problem.

Actions:

- **Explain** that Apple is aware of the problem and has implemented a solution.
- **Refer** customers to AASP to obtain the kit.
- **Explain** that while the shims may look exactly like a rolled-up piece of an ImageWriter I manual, this is not the case.
- **Fulfill** the kit to irate customers on a case-by-case basis for customer stated reasons.

[Incredible as this may seem, the take-off went downhill from there...]

More For The Micro-Munchkins

Last month's column looked at young kids using Macs, and heard from some BMUG parentoids. At some recent meetings, several small local vendors demonstrated some useful educational software. Here are some of their offerings:

- **CrissCross'em** is a $34.95 Crossword puzzle generating application made by Synaptic Solutions in Mill Valley. It uses a word-and-definitions database and makes a puzzle, complete with clues and numbers. The works. The program comes with a set of thirty-five hundred words pulled from SAT tests.

The puzzles can be solved on the computer, or printed out. This is great if you want to keep the kids busy while you're taking a trip—not everyone has a PowerBook they can toss over the back seat to the munchkins. Or wants to trust the little darlings to play properly when Mommy or Daddy has to keep their eyes on the road.

If you are interested in a special set of words, you can create your own custom list in the program or with your word processor. Another CrissCross'em feature I like is the ability to cheat. Oh, horrors, you say?

Many kids, especially the younger ones, when balked become easily discouraged with learning. You hear, "I'm no good in this or that subject." This program "cheats" by giving the kid a problematic word in sentence context, letting the child continue with the exercise. Sometimes parents forget that the point of the game is the successful learning of the words and not the completion of the crossword puzzle without added help.

Synaptic also makes a good vocabulary drilling program called **Word Hunt**. It uses the CrissCross'em word data sets and has four different games that let one or two players test their skills. The Word Hunt games not only keeps track of the words learned, but also the ones missed. The program can be set to give the problematic words special attention. Word Hunt has a list price of $49.95.

- At the BMUG Fest a couple of months ago, we got a glimpse of Sinologic Software's **HyperChina**, an interactive language course for Mandarin Chinese. The $195 program was developed by a team of instructors from U.C. Berkeley and covers the first-year college syllabus.

The program is not simply a set of drills for the written language, but contains a spoken sample in a man's and woman's voice for every word and sentence covered in the program. It teaches the correct pronunciation, reading, and writing of one thousand characters. If your Mac supports sound input, you can record your own pronunciation of a word and then compare it to the correct version.

HyperChina demonstrates, stroke by stroke, how to correctly write each character. The order of each stroke in a character is important. There are also some games, a singalong module, and even a guide to ordering food in a Chinese restaurant! Perhaps this part could be spun out as a Newton product—and you could use the Newton pen as a spare chopstick.

Tip City

- Newton handwriting recognition has been the subject of many an article and flame. Everyone seems to focus on tweaking the Newton software. Several new hardware hacks have surfaced to help boost recognition.

The flat stylus of the original MessagePad was actually part of the problem. There's a good reason that everyday pencils and pens are cylindrical—it's easier for users to control. The flat pen cannot give as good a result, since the flat implement prevents natural writing. Wouldn't you know that the recently released new MessagePad model comes with a cute little spring-loaded rounded stylus.

WriteWare in San Jose has a couple of cool products that can improve the pen part of pen-computing. Their **S.N.A.P.** line (Stylus Not a Pen) are replacement stylus inserts for the fancy pens your loved ones gave you for your last birthday. They have $8.95 refill substitutes for Cross, MontBlanc, Meisterstuck, Shaffer, Parker ,and other pens. Onlookers will certainly get the point when you pull this high-class upgrade out of your pocket and start writing away on the screen of your personal

RESOURCES:

Sinologic Software
P.O. Box 5242
Berkeley, CA 94705
1-800-869-9654

Synaptic Solutions
P.O. Box 872
Mill Valley, CA 94941
(415)381-2545

WriteWare
1428 Sunshade Ln.
San Jose, CA 95122
(408)295-4217

digital assistant of choice!

Perhaps less impressive to the status-minded, but a bit more practical, are the **Stealth Stylus** models, The plain Stealth comes in plastic or metal and is a good workaday stylus. The Stealth Stylus II combines the stylus with a twist-up real-ink pen. The Super model is a triple threat, with a stylus, pen, and pencil. They range in price from $7.95 to $24.95.

Another Newton handwriting tip passed from the Internet to SIG Newton, BMUG's special interest group for Newton technology. It concerns the action of the pen on the screen.

It seems that some users are bothered by writing on the very smooth surface of the display with an additionally super slick stylus. They complain the pen lifts at the wrong time or adds little tags at the end of a letter stroke. This makes sense, since we're accustomed to the friction between implement and paper, when writing. Most paper has "tooth," which we unconsciously use to help control our writing. The Newton eliminates this feedback with its slick writing surface. But all is not lost!

Look around for the transparency sheets for inkjet printers that have one smooth side, with the other textured. Cut the sheet to the size of the Newton screen, adding enough room to fit under the lips on the left and right sides. Place the glossy side of the plastic sheet down against the screen, leaving the rough side up to write upon. Reportedly, this change is undetectable and the screen image is not impaired. The additional tooth of the screen improves the pen's feedback and helps the user be more consistent when forming letters.

•Peter Linde is the devoted BMUG volunteer who has organized biweekly afternoon hardware clinics for members at the BMUG office, helping to restore hard drives and install RAM. He offers a fix for a corrupted font that can't be removed from the system folder when running System 7.1. You can tell this problem when you start getting the Error -39 messages. The font problem by itself is plenty annoying, but is compounded when the Mac refuses any attempt for a fix.

The solution requires you to pull the entire Fonts folder onto the desktop, and then to Restart. This forces the system to create a new minimal Fonts folder with only a few basic fonts. These fonts are stored in the Mac's ROM (read-only memory) chip.

But magically you can now pull the bad font out of the old folder. If you now drag the original Fonts folder back into the System folder, it will replace the johnny-come-lately and give you back all your old fonts. After yet another Restart, you will be back in business. Thanks, Peter!

Shareware Spotlight

If you're bored with typing the same thing over and over again, you might wish to look at Riccardo Ettore's **TypeIt4Me** control panel. The program lets users set up keyboard shortcuts for text entry.

After defining a bunch of entries (the maximum is

WHAT IS BMUG?

BMUG is an educational, nonprofit, consumer advocacy group organized to share information and provide critical direction to users and developers in the computer community worldwide. It is an independent advocate, not affiliated with any manufacturer, delivering trustworthy information and useful products.

Like any growing organization, it is many different things to its fifteen thousand international members. BMUG supports many special interest groups (SIGs), 18-line Planet BMUG and 11-line BMUG Boston BBSes, a software library, weekly meetings, publications, and much more. BMUG also puts out a semi-annual 500+ page book that we call our "newsletter."

Our motto continues to be: We're in the business of giving away information.

Come and join in the dialogue at the BMUG main meeting every Thursday evening, 6:30 to 9:30 (or whenever we finish), on the UC campus. BMUG West and BMUG South are monthly meetings held in San Francisco and San Jose. Check the Announcement Line at (510)549-2684 ext. 8.

The BMUG Office, 2055 Center Street (a half block from the BART station) is open to the public 8:30 am to 4:30 pm. Please come by, say hello, and meet other members.

The BMUG HelpLine provides volunteer technical assistance and telephonic hand-holding for our members. If your question can't be answered on the spot, we try to get you in touch with someone who can help. Improve your Macintosh education and help others by becoming a HelpLine volunteer!

BMUG has one of the most up-to-date, comprehensive software libraries around, with hundreds of disks filled with the latest versions of public domain or shareware programs. BMUG also produces CD-ROM collections, including the digital video TV-ROM™ Too, and the BMUG PD-ROM.

Planet BMUG and BMUG Boston are graphical user interface FirstClass bulletin board systems, offering the latest in shareware, as well as news, private email, rumors, etc. With our 18-line capability, you can have access to BMUG almost twenty-four hours a day. It's easy to use, fun, and a great resource.

BMUG can be found on most online services, including e•World. BMUG can also be reached through the Internet network through UG0001@applelink.apple.com .

To get some further information about BMUG please write to: BMUG, 1442A Walnut Street, #62, Berkeley, CA 94709. If you prefer to phone our business office, call (510)549-BMUG, or fax (510)849-9026.

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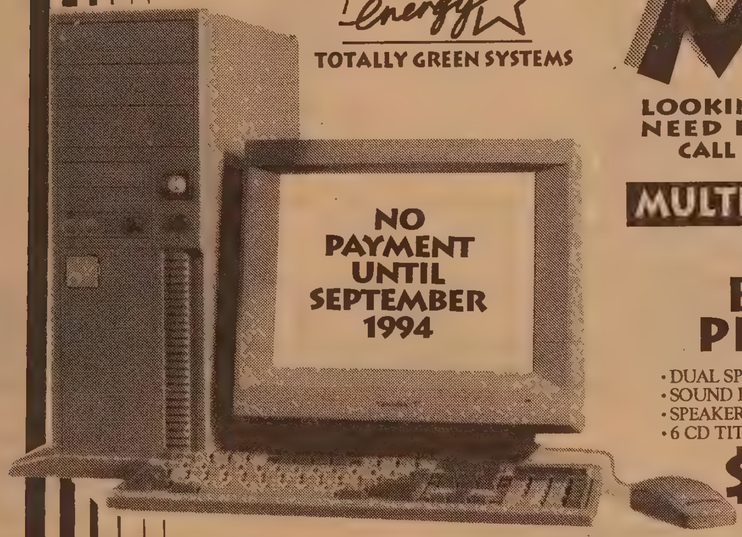

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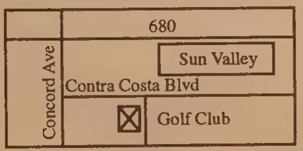

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MON-WED-FRI 9-6 TUE-THUR 9-8:00 SAT 10-5 something around twenty-five hundred in a set), you can let the Mac do the typing for you. The shortcut entries can be as short as a single word or as long as several paragraphs. Each one bears a short nickname (up to twenty-five characters long), which is easy to remember because you make it up.

If I enter "T bl w sent adn pd," TypeIt4Me expands the nonsense into, "The bill was sent and paid." Not only did I cut down on the number of keys that I had to hit, but it saved spelling checker time by automatically correcting the common "adn" for "and" mistake. Many people set it to blast out their name and vital statistics at the end of a letter.

You have complete control over when and where it will work. But TypeIt4Me is available at all times, during a fast fax or in a paint program. The triggering of the automatic typing is easily stopped with an option-space if you ever need to type the nickname as an actual word.

The program has a shareware fee of $30. ■

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BMUG CALENDAR EVENTS

June 2	Synaptic Solutions Word Hunt and CrissCross'em (education); CD Solutions PowerMac video stuff.
June 9	Advanced Software Dateview and TurboDialer (calendar and phone productivity); Connectix RAM Doubler (memory utility).
June 16	Adobe New stuff; CCNET Contra Costa Net (internet).
June 20	BMUG South at 1922 The Alameda, United Way Office in San Jose. Advanced Software Dateview and TurboDialer (calendar and phone productivity); CD Solutions PowerMac video stuff.
June 23	Demonstrations not scheduled yet. Call Announcement Line.
June 27	BMUG West at Exploratorium Science museum in San Francisco. Connectix RAM Doubler (memory utility); CD Solutions PowerMac video stuff.
June 30	Demonstrations not scheduled yet. Call Announcement Line.

Please Note: BMUG main meetings are held in 22 Warren hall on the UC campus (near University and Oxford). Call the BMUG Announcement Line at (510) 849-9114 for the latest news on meetings, special interest groups (SIGs) and seminars. See you there!

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First Class 松 $3,800.00

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486DLC40C VLB 87DX40Inc'd	179	339	589	629	749	789	819	849	919
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486SX50 ISA	189	349	599	639	759	799	829	859	929
486SX40 ISA	169	329	579	619	739	779	809	839	909
486SX33 ISA	149	309	559	599	719	759	789	819	889
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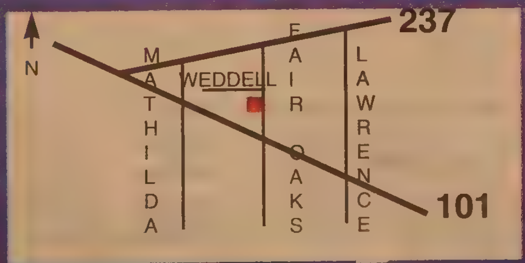

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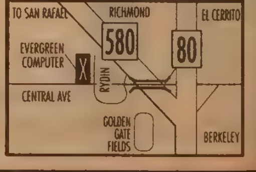

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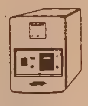

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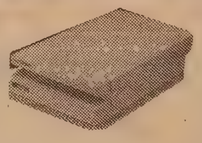

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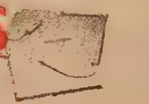

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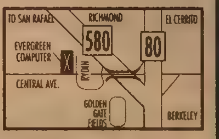


High-Speed Modems From AT To Z

(Or, How To Wade Through "Register Alphabet Soup")

By Lenny Bailes

If you've noticed the amazingly low prices in *MicroTimes* on high-speed modems, you've probably contemplated replacing your 2400bps dinosaur with a newer model.

But once you upgrade to a 14,400bps screamer, you may find that getting satisfactory high-speed performance is a little tricky: The new modem sings into the telephone line like a bat on steroids, but stubbornly flashes "Connect 2400" messages at you, no matter what you do. Or when you do finally see a "Connect 9600" message, you have trouble with file transfers. You experience timeouts, sudden disconnects, weird error messages, and data transfer rates far below what you expected.

These modem woes are the underside of high-speed communications. If you experience them, you aren't alone. The following series of tips and tidbits is designed to help you past the stumbling blocks that confront unwary users when they upgrade to a high-speed modem.

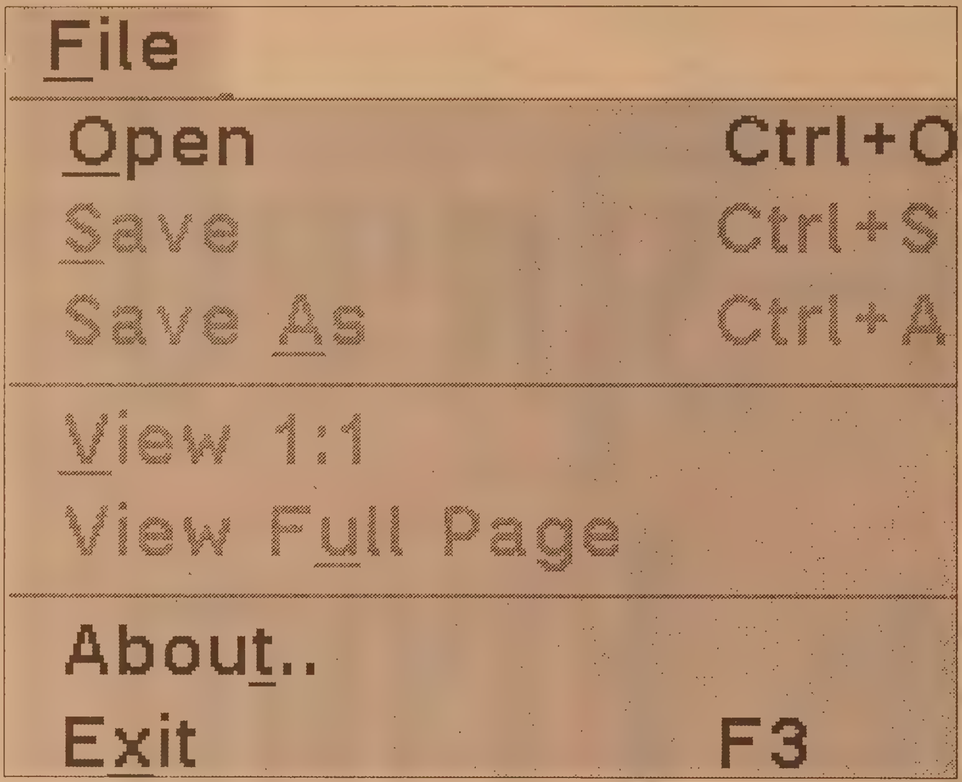
Establishing A Connection

When you call up another high-speed modem, the first thing you notice is that the series of exchanged initialization tones can last up to thirty seconds. This is considerably longer than the "handshake" for a 2400bps connection. Make

continued on page 204

continued from page 92

FIGURE 5



The remaining options in the Configure submenu can be used to scan documents, either to save as .PCX or .TIF files (see the File submenu in Figure 5) or to paste into other applications through the Clipboard.

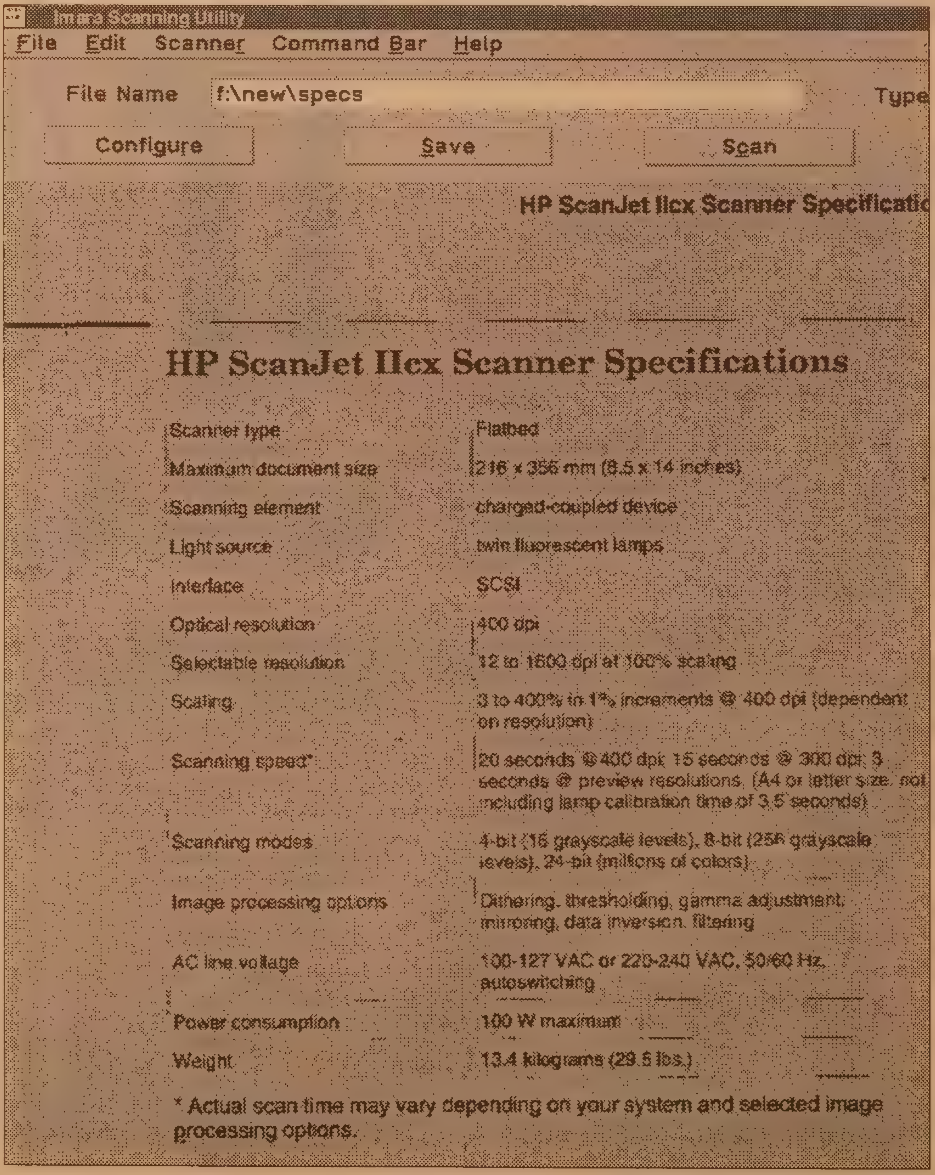
For series of documents, ScanTool offers the more convenient Command Bar option. It opens a dialog band at the top of the window (Figure 6) which gives direct access to the options in the Scanner submenu.

Configure can be used as above to select settings. Scan will scan the document and display it in the window. For example, the page of the HP manual listing the IIcx specifications in Figure 1 is shown as a scanned document at 75x75 resolution in the ScanTool window in Figure 6.

At this point you can use the Clipboard cut and paste facilities in the Edit submenu (Figure 7) to send cropped images to the Clipboard for either input to other applications, or to return to the ScanTool window for saving.

The Command Bar lets you select the type of file you want (.PCX or .TIF), name the file, and save it. Figure 6 shows the image being saved as a .PCX file. ScanTool will automatically add the extension as per your format selection, and it can use the name you give to the first file to sequentially name all subsequent files from a series of scans. Thus, if you name the first file FIG1, Scan Next will save the result of the next scan as FIG2, and so on.

FIGURE 6


Intra Scanning Utility
File Edit Scanner Command Bar Help
Type
Configure
Save
Scan
HP ScanJet IIcx Scanner Specificatio

File Name f:\new\specs

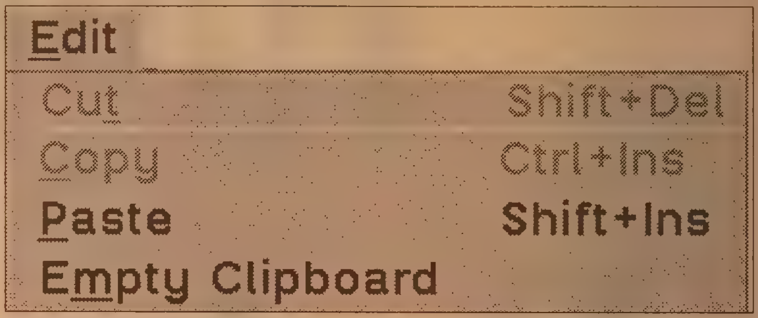
HP ScanJet IIcx Scanner Specifications

Scanner type	Flatbed
Maximum document size	216 x 356 mm (8.5 x 14 inches)
Scanning element	charged-coupled device
Light source	twin fluorescent lamps
Interface	SCSI
Optical resolution	400 dpi
Selectable resolution	12 to 1600 dpi at 100% scaling
Scaling	3 to 400% in 1% increments @ 400 dpi (dependent on resolution)
Scanning speed*	20 seconds @ 400 dpi; 15 seconds @ 300 dpi; 3 seconds @ preview resolutions. (A4 or letter size, not including lamp calibration time of 3.5 seconds)
Scanning modes	4-bit (16 grayscale levels), 8-bit (256 grayscale levels), 24-bit (millions of colors)
Image processing options	Dithering, thresholding, gamma adjustment, mirroring, data inversion, filtering
AC line voltage	100-127 VAC or 220-240 VAC, 50/60 Hz, autoswitching
Power consumption	100 W maximum
Weight	13.4 kilograms (29.5 lbs.)

* Actual scan time may vary depending on your system and selected image processing options.

ScanTool's simplicity comes at the expense of functionality, which, given its origins, is to be expected. Besides limited settings and very basic editing capabilities (available only in 1:1 view mode), its most serious limitation is failure to support the color capabilities of the IIcx; it scans only in black and white. Tests at the various resolutions supported show that while the dithering options cut the size of a graphics file by a maximum of 50%, they do not resolve color or shading satisfactorily, particularly with overlapping text. Neither does it seem to multithread or even permit multiprocessing: while it scans—which, in the case of 300x300 takes some time—nothing else can be done on the system.

FIGURE 7



OS/2 badly needs decent scanning capabilities, particularly TWAIN-enabled applications. One Florida company is advertising such a "scanning and viewing utility" providing "instantaneous panning and scrolling across an image" and supporting a large variety of file formats, but I have not received any replies to my queries. A German company says that it is in the process of translating into English its image processing application—claimed to be equivalent to Adobe's PhotoShop for Windows—and will soon make it available in the US. I will keep you posted. ■

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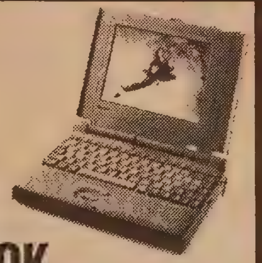

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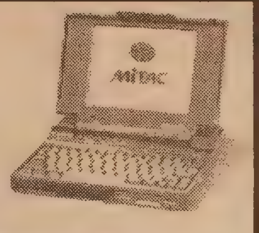

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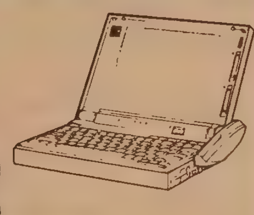

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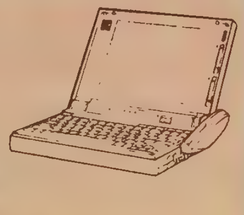

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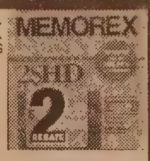

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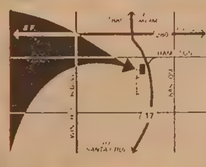

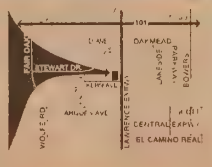

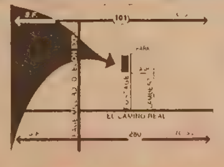

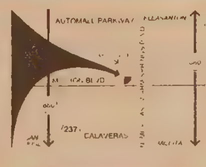

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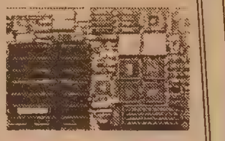

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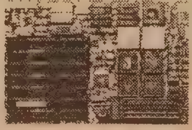

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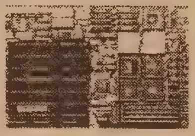

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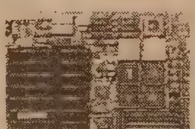

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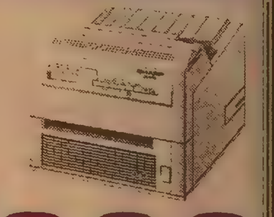

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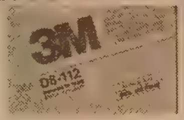

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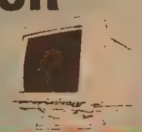

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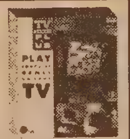

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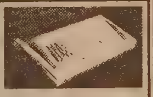

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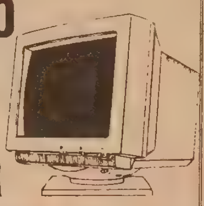

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Quadra 605 68LCO40 25MHz CPU • 8MB RAM Expandable to 36MB • 1.4 Floppy Disk Drive • 250MB Hard Drive • 2 Serial Ports • ADB Port • Video Output for all Apple Displays

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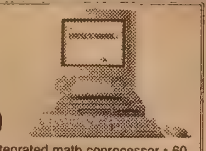

PowerPC 601 RISC processor; integrated math coprocessor • 60 megahertz speed • 8MB RAM expandable to 72MB Apple SuperDrive floppy drive • 160MB Hard Drive • Internal expansion slots for one NuBus expansion card; dual-channel high performance SCSI that supports up to seven SCSI devices Two serial ports SCSI port • Apple Desktop Bus Port • Video input/output port • Standard monitor port • Built-in support for all Apple displays and supports several third party VGA and SVGA displays • Built-in LocalTalk and high-speed Ethernet connections; AppleTalk networking software • Power Macintosh will run DOS and Windows applications with SoftWindows by insignia Solutions

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Apple SuperDrive Floppy Disk Drive, Internal 320MB Hard Disk Drive • Three expansion slots- One for a processor-direct card, One for an internal modem, and One for RAM • Serial port • ABD port • Video-output port • Power adapter port • Sound-input (stereo) port and integrated microphone • Sound output (stereo) port and speakers • SCSI port.

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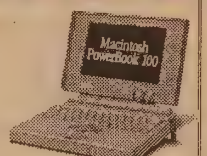

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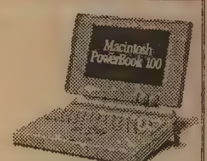

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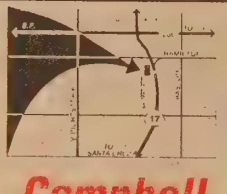

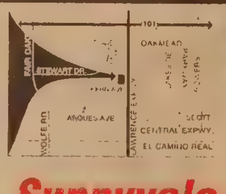

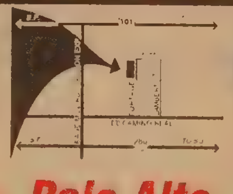

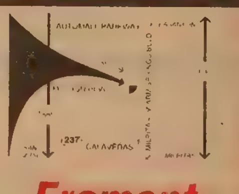

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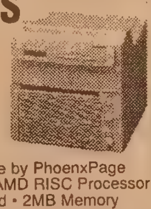

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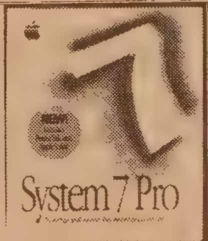

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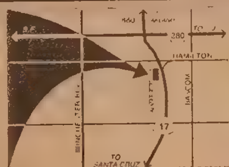

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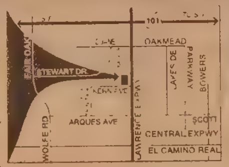

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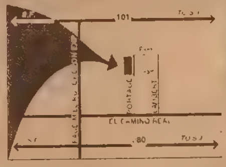

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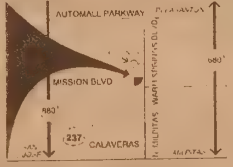

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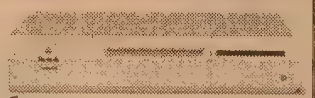

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Offering a breakthrough in affordable power and compatability, the Macintosh Quadra 610 DOS Compatible features dual microprocessors. Its fast Motorola 68040 processor provides high performance for Macintosh applications. And its Intel486 sx processor delivers strong performance for DOS and Windows applications. Features include: 25MHz Motorola 68040 processor • 25MHz Intel486 sx processor • 8MB of Ram, expandable to 100MB • 512K of VRAM, expandable to 1MB (Macintosh environment 512K of RAM for videos (DOS environment).

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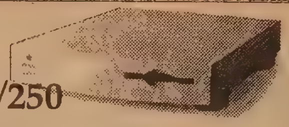

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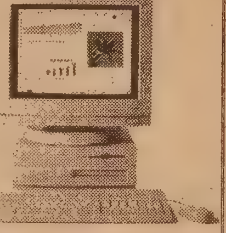

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is one of the expandable, mainstream members of the new high-performance line of Macintosh computers based on PowerPC chip technology. They're built with the speed, expandability and networking capabilities that business people require for word processing, desktop publishing, and working with complex spreadsheets and databases. Features include • 66MHz PowerPC 601 microprocessor with floating-point processor and 32K Cache • 8MB of RAM, expandable to 136MB DRAM display support • 1MB of VRAM for second display support, expandable to 2MB • 2MB of VRAM for second display including NTSC or PAL monitors. Power Macintosh will run DOS and Windows applications with SoftWindows by insignia Solutions **Monitor and Keyboard Sold Seperately.**

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PowerPC™

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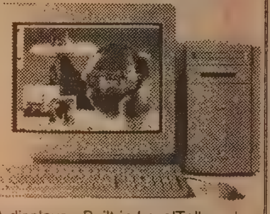

Apple® Power Macintosh 8100/80 8MB RAM/250MB Hard Drive/CD-ROM

PowerPC 601 RISC processor; integrated math coprocessor and 256K memory cache • 80 megahertz speed • 8MB RAM expandable to 264MB • Apple SuperDrive floppy drive • 250MB Hard Drive • CD-ROM • Internal expansion slots for three NuBus expansion cards; dual-channel high performance SCSI that supports up to seven SCSI devices • Two serial ports • SCSI port • Apple Desktop Bus Port • Video input/output port • Standard monitor port • Built-in support for all Apple • displays and supports several third party VGA and SVGA displays • Built-in LocalTalk and high-speed Ethernet connections; AppleTalk networking software. Power Macintosh will run DOS and Windows applications with SoftWindows by insignia Solutions **Monitor and Keyboard Sold Seperately.**

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Rock Rap 'N Roll is a breakthrough music makin' machine that will have you jammin' like a pro in no time at all. Using pre-composed original music, combined with a unique interactive interface, Rock Rap 'N Roll allows any user, with or without knowledge of music, to have fun producing professional-quality music.

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- A digital cast of 14 characters
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- High intensity arcade play in 30 environments.

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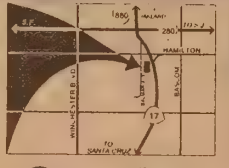

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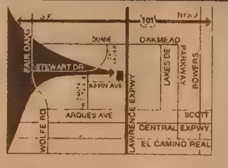

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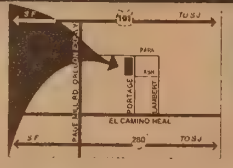

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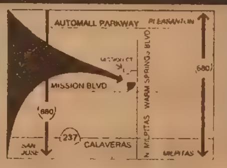

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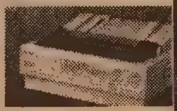

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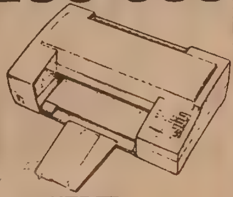

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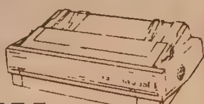

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2 Scalable Fonts • 252 CPS Draft Mode 84 CPS NLQ Mode

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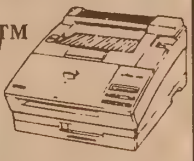

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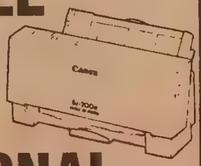

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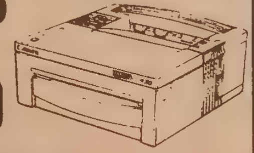

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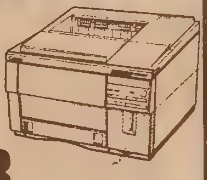

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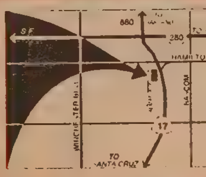
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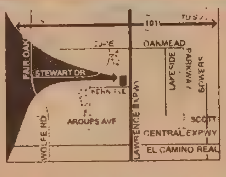
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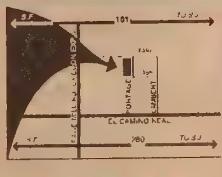
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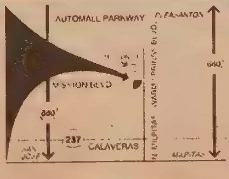
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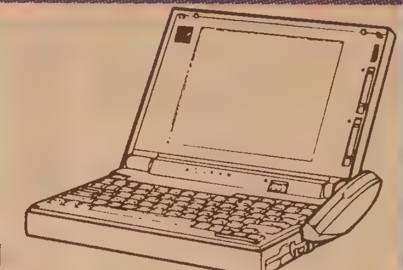

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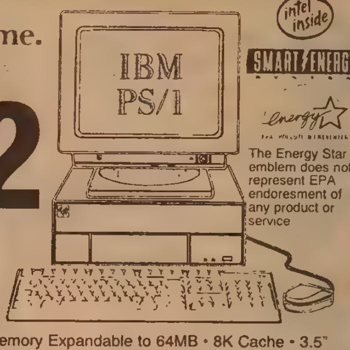

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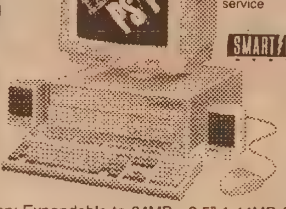

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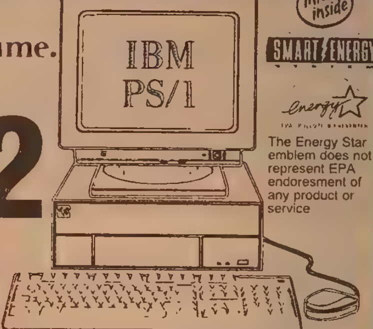

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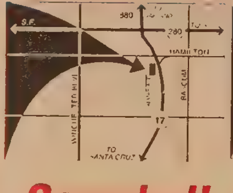

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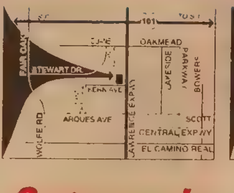

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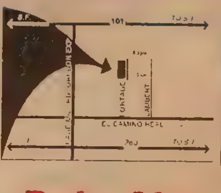

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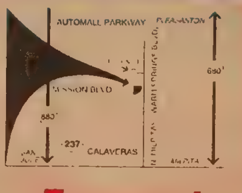

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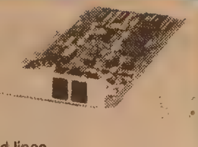

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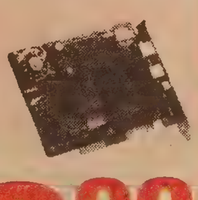

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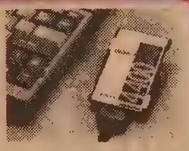

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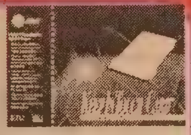

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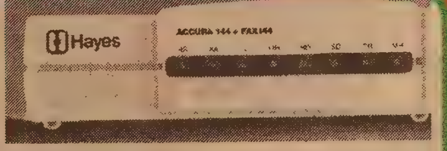

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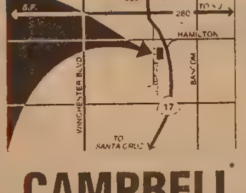

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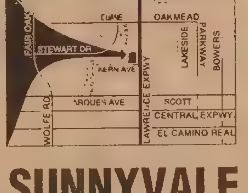

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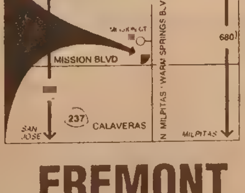

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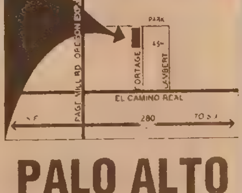

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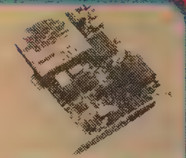

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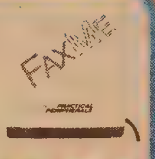
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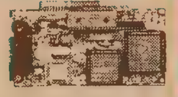

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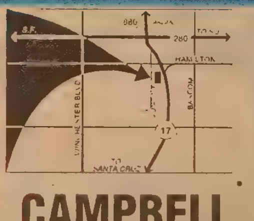
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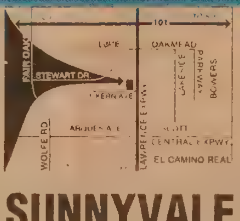
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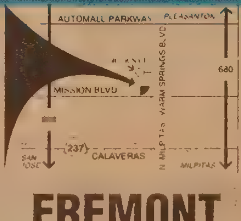
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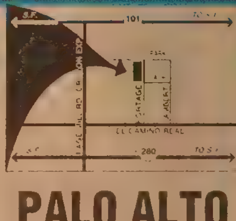
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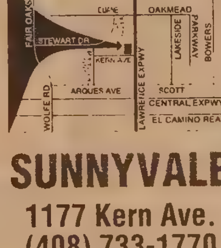
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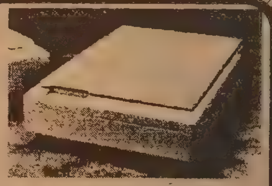

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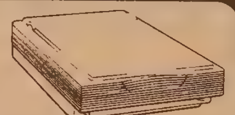

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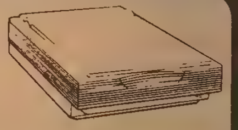

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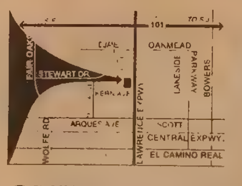
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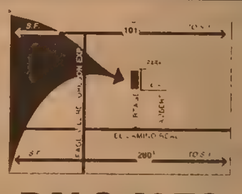
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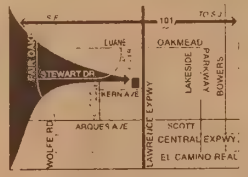

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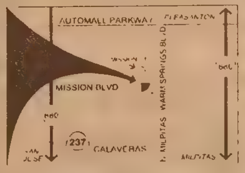

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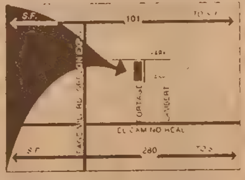

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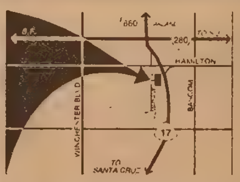

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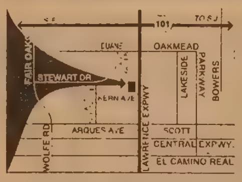

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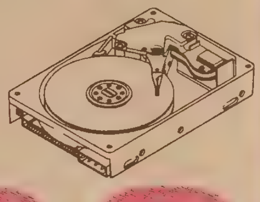

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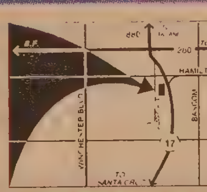
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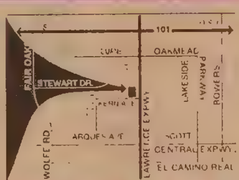
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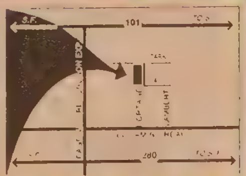

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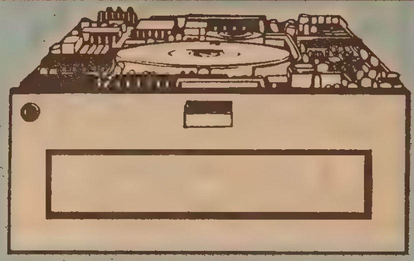

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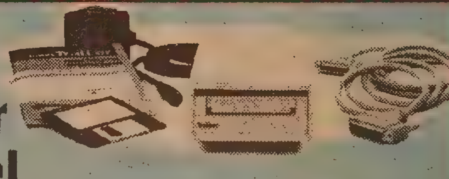

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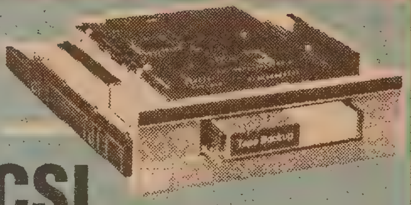

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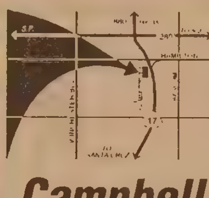

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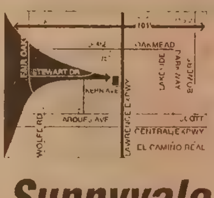

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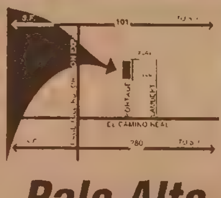

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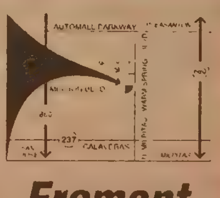

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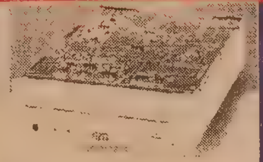

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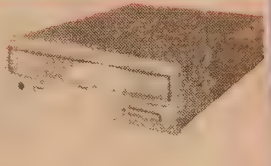

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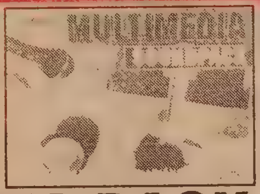
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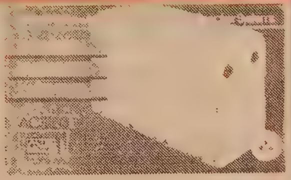

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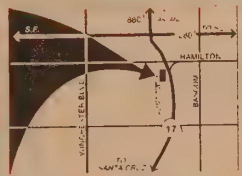
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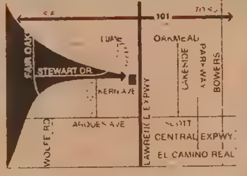
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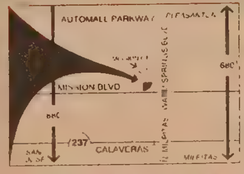
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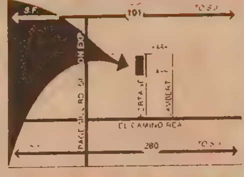
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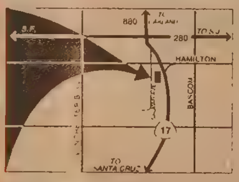

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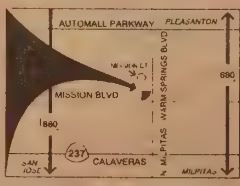

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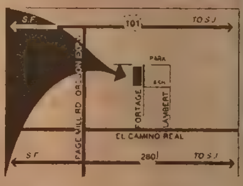

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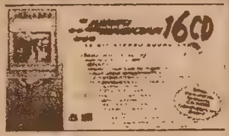

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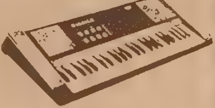

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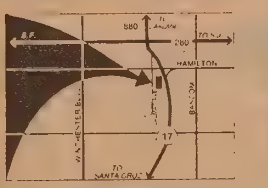
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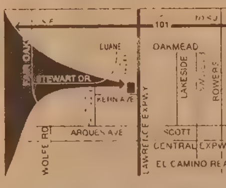
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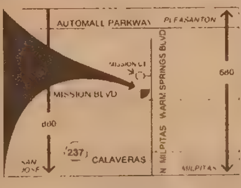
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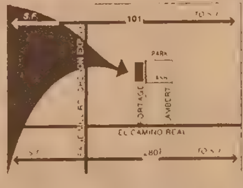
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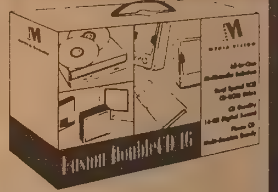

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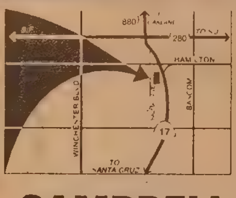
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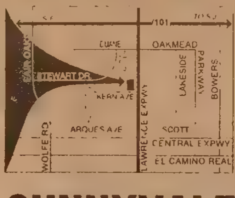
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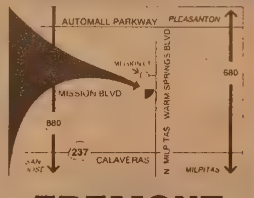
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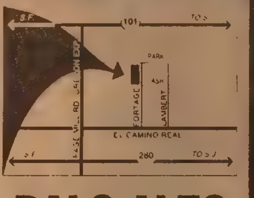
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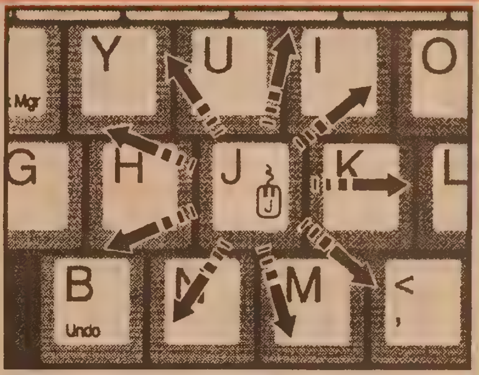
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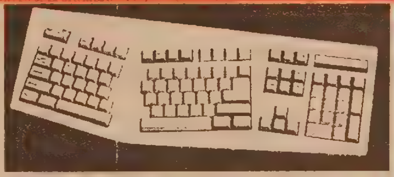

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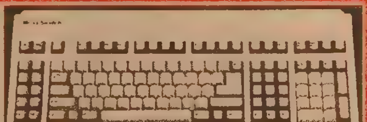

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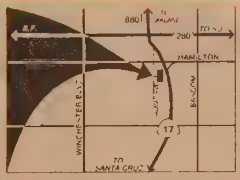
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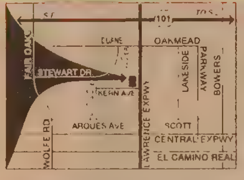
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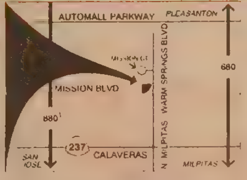
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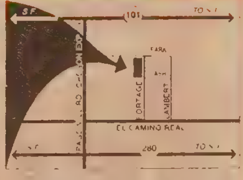
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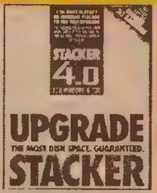

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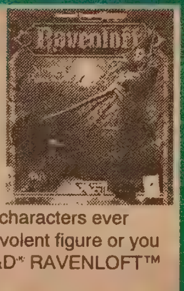

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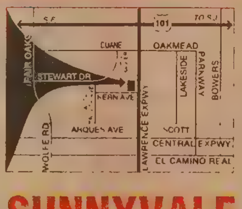

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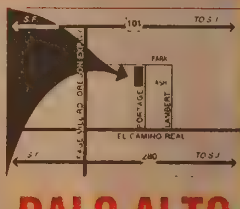

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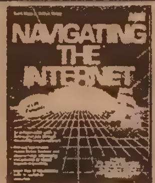
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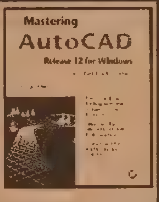
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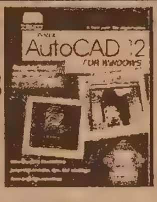
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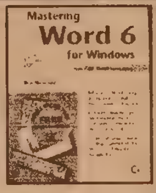
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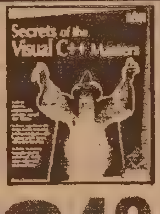
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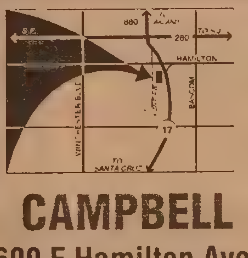
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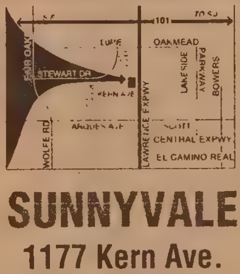
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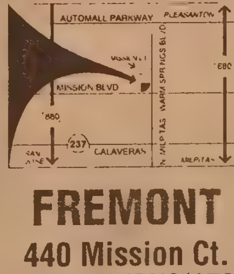
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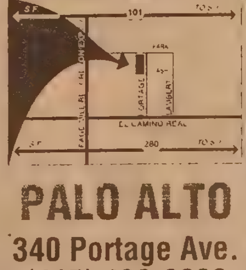
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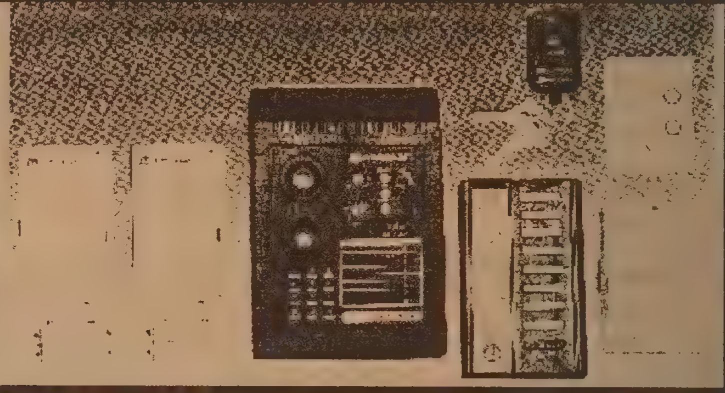

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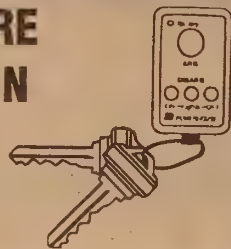

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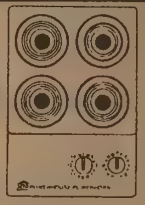

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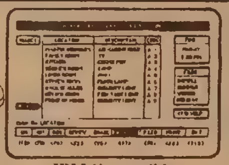

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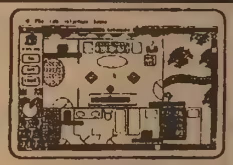

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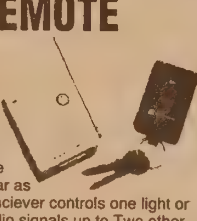

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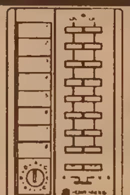

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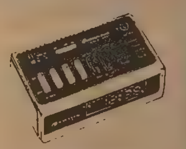

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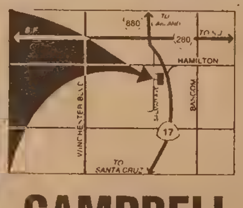
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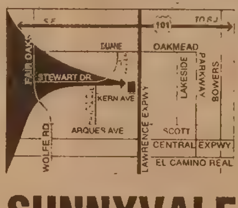
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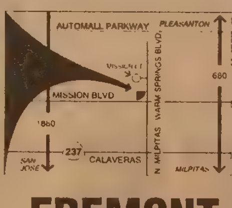
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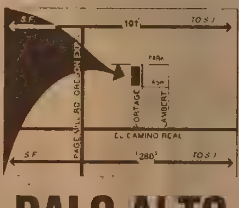
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6-OUTLET SURGE PROTECTOR

PM6SP2 • 140 Joules
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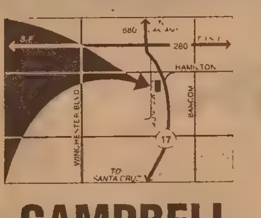
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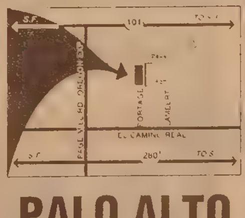
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Everyone has flipped for flip phones, and this GE Pocketfone is one of the reasons why! With its 100 Number Alphanumeric Memory (names and numbers can be stored together and scanned alphabetically), Menu Scroll, Dual NAM, 8 Level Call Restrictions, Last Number Redial, Lighted Keypad, Auto Scratchpad, Mute, Low Battery Warning, Speed Dialing, Call Mailbox, 90 Minute Talk Time Battery, Overnight Charger, and much more!Refurbished to work like new at only...

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Model CT-400R**
#1906411

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CELLULAR FLIP PHONE

This premium value cellular phone from Motorola comes equipped with 30 number memory, LED display, call timer, signal strength meter, a battery with 75 minute total talk time, and an overnight charger for only...

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Model DPC-550**
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ALPHA MICRO-TAC CELLULAR PHONE

If it's small and lightweight you're looking for, this is the cellular phone for you! With its 101 alphanumeric memory, a desktop charger, and standard battery, this technologicaly advanced cellular phone can be yours for only...

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MICRO TAC LITE CELLULAR PHONE

This popular pocket sized cellular phone from Motorola combines the convenience and high performance with features that include 101 Alphanumeric Memory, Retractable Antenna, Dual Nam, Automatic Redial, Super Speed Dialing, Battery, Overnight Charger, Carry Case, and more. Now just....

$374 95*

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Model Micro Tac Lite Base**
#1750739

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Model Micro Tac Lite**
#1705832

MOTOROLA

MICRO TAC ULTRA LITE CELLULAR PHONE

WITH VIBRA CALL

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Motorola's lightweight champion of cellular phones tips the scales at only 5.9 ounces and contains a unique ring selector that includes a setting for vibrate, just like a pager! Other features include 101 alpha-numeric memory, memory scroll, recall, two batteries, rapid charger, carry case, and more for only ....

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Model Micro Tac Ultra Lite**
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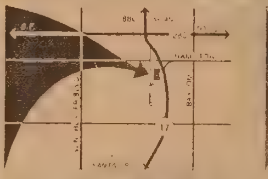
**Service Activation Not Required. No Sales To Dealers Or Resellers. Limit One Per Family.



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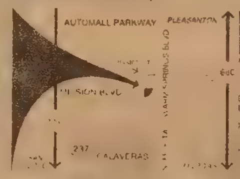

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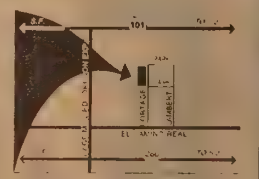

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Outstanding features like last number redial, auto stand-by, auto talk, and flash, make this Uniden cordless phone an excellent value at.....

$33.99

MODEL CT-301
#1805453

Panasonic

10 CHANNEL AUTOSCAN CORDLESS PHONE

Panasonic's newest cordless phone comes equipped with a retractable flexible rubber antenna, sound charger technology, which helps filter out background noise resulting in enhanced sound quality, and 1-way paging between the base and handset. An excellent value at only...

$79.95

MODEL KX-T3850
#1764839

AT&T

10 CHANNEL CORDLESS PHONE

This feature packed AT&T cordless phone offers 10 channel selection, 2-way page, 9 number memory, receiver volume on handset, handset locator, digital security system, last number redial, and flexible antenna all for just...

$79.95

MODEL 4335
#1888612

SONY.

10 CHANNEL CORDLESS PHONE

WITH LIGHTED KEYPAD

This 10 channel cordless phone offers out of range alert, extended 7-day battery standby power, 10 number speed dialing, and many other features for only...

$97.95

MODEL SPP-77
#1766990

10 CHANNEL CORDLESS SPEAKERPHONES

uniden

10 CHANNEL CORDLESS SPEAKERPHONE

This 10 channel speakerphone uses innovative compander technology to virtually eliminate background noise for clear reception. It's desk/wall mountable, has auto redial, flash, 2-way page/intercom, selectable ringer tone, and 20 number memory, all for only....

$69.99

MODEL EX-340
#1805486

SHARP

10 CHANNEL CORDLESS SPEAKERPHONE

WITH LIGHTED KEYPAD

Sharp's latest cordless phone comes equipped with outstanding features that include lighted keypad, 10 channel auto select, 21 day standby, 10 number memory, 1-way page, retractable antenna, last number redial, flash, and more. An excellent value at just...

$99.95

MODEL CL-200
#1885701

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GE We bring good things to life.

10 CHANNEL DUAL KEYPAD SPEAKERPHONE

This feature packed 10 channel cordless phone comes equipped with speakerphone for hands-free operation, volume control, 10 number memory, 2-way page/find and intercom, flexible antenna, dual keypad which enables you to dial from the base or handset, flash, and last number redial. An excellent value at just...

$99.95

MODEL 2-9635
#1872565

Panasonic

10 CHANNEL AUTOSCAN CORDLESS DUAL KEY-PAD SPEAKERPHONE

WITH SECURE GUARD VOICE SCRAMBLING

Panasonic's comes equipped with secure guard which scrambles your voice when others try to listen in on your conversations with other cordless phones, radios or even scanners! Other features include quick charge technology enabling to fully charge the battery in only 3 hours for 21 day standby, 2-way paging, intercom, 10 number memory, high gain antenna, and much more. All for only...

$159.95

Available in Black or White

MODEL KX-T3965
#1912373

CORDLESS PHONES W/ANSWERING MACHINE

GENERAL ELECTRIC
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10 CHANNEL CORDLESS PHONE

WITH ANSWERING MACHINE AND VOICE TIME/DAY STAMP

This GE 10 channel cordless speakerphone with answering machine offers features that include auto scan capability, 10 number memory, flexible, page/find from base to handset, voice time/day stamp,memo recording led call counter, time check, ringer select, and message length selector, just to name a few. An excellent value at just..

$129.95

MODEL 2-9645
#1872576

Panasonic

10 CHANNEL CORDLESS SPEAKERPHONE

WITH ANSWERING MACHINE

This cordless answering system with sound charger technology delivers sound so clear, you will hardly believe your ears! Some of the features included are, 2- way paging, intercom, auto security system, message alert, 2-way and memo recording just to name a few. Now only...

$149.95

MODEL KX-T4330
#1796483

AT&T

10 CHANNEL CORDLESS

WITH ANSWERING SYSTEM

You will be amazed at clarity of this AT&T cordless phone! By incorporating clarity plus circuitry with AT&T Bell Lab 5 design, the result is corded sound quality that virtually eliminates static! Other features include pager, Intercom and voice time/day stamp. Now only...

$179.99

MODEL 5600
#1605510

SONY.

10 CHANNEL CORDLESS SPEAKERPHONE

W/ ANSWERING MACHINE & VOICE TIME DAY STAMP

This innovative product from Sony actually combines a ten channel cordless phone with a full featured answering machine in one sleek package. Features include 256 security codes, 7day stand-by, compander noise reduction and remote message retrieval.

$197.95

MODEL SPP-A60
#1720590

900MHz CORDLESS PHONES

BELL Phones
BY NORTHWESTERN BELL PHONES

60 CHANNEL 900MHz CORDLESS PHONE

This incredible value from Northwestern Bell comes equipped with 60 channel selection, lighted keypad, 10 number memory, last number redial, flash, handset volume adjustment, intercom, page, and much more, all for only....

$199.99

MODEL
Excursion 3900
#1908114

AT&T

DIGITAL 900MHz CORDLESS PHONE

AT&T, the leader in digital telephone technology once again leads the way into the future with the introduction of this 900MHz cordless phone. By operating at the 900 MHz frequency range rather than the conventional 46 to 49 MHz range, this AT&T cordless phone will provide clearer transmission with less noise and interference from other electronic devices, as well as extended range performance! Features include 10 number memory, mute, hold, flash, last number redial, one-way paging, out-of-range-indicator, digital voice encryption, and much more for only...

$249

MODEL 9100
#1802287

SONY.

40 CHANNEL 900MHz CORDLESS SPEAKERPHONE

By combining 900MHz Enhanced Reception with a 40 Channel Auto Scan system, Sony has designed a cordless phone that not only provides clearer transmission with less noise and interference than conventional 46 to 49 MHz cordless phones, but also gives you enhanced channel selection resulting in greater flexibility if you encounter interference during a call. With 2-Way Paging/Intercom, Base Speakerphone, 3-Way Conversation, 20 number memory, last number redial, flash, and more. Sony has designed the perfect cordless phone for the home or office at only...

$279.95

MODEL SPP-ER1
#1839009

uniden

TWO-LINE 900MHz CORDLESS PHONE

WITH DUAL KEYPAD SPEAKERPHONE

By utilizing Digital 900Mhz Spread Spectrum Technology along with Two-Line Operation, Uniden has developed the ultimate cordless phone. Other features include dual keypad speakerphone, intercom, two-way page /find, conference calling, 20 number memory, call monitor, and much much more. An excellent value at just....

$349

MODEL EXP-9200
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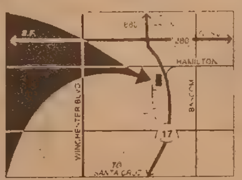

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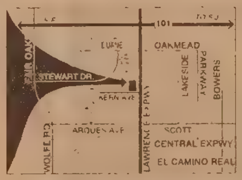

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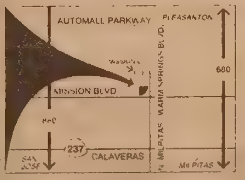

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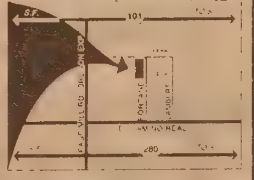

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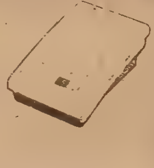
AT&T



ALL DIGITAL ANSWERING MACHINE

This AT&T answering system utilizes tapeless digital technology to ensure consistent recording quality over the life of the system. The convenience of new message playback, outgoing message bypass, remote system turn on or off and remote message recording makes this an excellent value at only...

$69.95

MODEL 1710
#1853906

GENERAL ELECTRIC
GE We bring good things to life

ALL DIGITAL ANSWERING MACHINE
WITH THREE MAIL BOXES

With three mailboxes to choose from, members of the household can have messages stored for them in their own mailbox! The all digital capability eliminates the need for moving parts and allows for instant playback of incoming messages-no need to wait for a tape to rewind or fast forward! Other features include voice time/day stamp, two outgoing messages, digital counter, selective message erase and much more for only...

$89.95

MODEL 2-9876
#1839261

SONY.

ALL DIGITAL ANSWERING MACHINE
W/ VARIABLE SPEED MESSAGE PLAYBACK

Sony has taken digital technology to a new dimension with this beautifully-designed, all digital answering system. The variable-speed message playback controller allows you to speed up (to 1.6 times speed) or slow down (to 0.7 speed) playback of messages without changing pitch. In addition, you can skip, repeat or backspace messages. The multi-function LCD display functions as a digital message counter, clock, call timer, answer mode indicator, and back-up battery strength indicator, while the voice time/day stamp automatically records the time of the message receipt after each message. Other features include: Voice-guided operation, Pre-recorded greeting, Announce-only mode, Memory usage guage, Audible message alert, Remote on/off, Auto interrupt, Memo recording, 2-way conversation recording, and Adjustable ring delay. An invaluable addition to any home or office at only...

$129.95

MODEL
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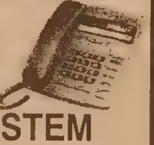
#1803901

Panasonic



ALL DIGITAL 4 MAILBOX ANSWERING SYSTEM
W/SPEAKERPHONE & VOICE TIME/DAY STAMP

Panasonic's fully featured answering system comes equipped with 30 minute storage capacity, voice time/day stamp, speakerphone, voice menu, 4 personal mailboxes with security, lcd display, message scan, programmable alarm, message transfer, 2-way record, selective message delete, message skip/repeat, auto disconnect, auto redial, 10 number memory, and much more! An invaluable addition to any home or office at just...

$199.95

MODELKX-T2880
#1841989

SPEAKERPHONES

SPEAKERPHONE
WITH 20 NUMBER MEMORY

The convenience of a hands free speakerphone allows you to do other tasks while carrying on a conversation on the phone. Features include 20 number memory, auto redial, mute, in-use indicator light, and more. An excellent addition to any home or office at only...

$19.99

#1915712

BELL Phones
BY NORTHWESTERN BELL PHONES
A U S WEST COMPANY

SPEAKERPHONE
WITH LCD DISPLAY

This Northwestern Bell speakerphone comes loaded with features like an LCD which displays time & date, alarm & timer, and number called display, on-hook dialing, 30 number memory, busy redial, flash, pause, speaker volume control, and much more for only...

$39.95

MODEL ET 2500S
#1810185

AT&T

SPEAKERPHONE

With features like hands-free speakerphone, 32 number memory, hold, receiver and speakerphone volume control, last number redial, flash, ringer control, programmable pause, mute, just to name a few, this AT&T speakerphone will be an excellent addition to any home or office at only...

$49.95

MODEL 725
#1671621

Panasonic

LCD READOUT SPEAKERPHONE

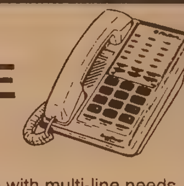
This outstanding value from Panasonic offers a 12-digit LCD readout for phone number, clock, call timer(minutes and seconds), and operating modes. Perfect for the home or office at only...

$69.95

MODEL KX-T2365
#163665

MULTI-LINE PHONES

BELL Phones
BY NORTHWESTERN BELL PHONES
A U S WEST COMPANY



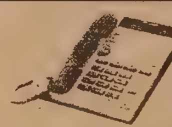
TWO LINE PHONE

Perfect for the home office with multi-line needs, this 2-line phone from Northwestern Bell features line-in-use LEDs, 3-way conferencing, 15 number memory, hold, flash, pause, and ringer controls. An excellent value at...

$39.99

MODEL
Easytouch 2202
#1890905

Panasonic



2-LINE SPEAKERPHONE
WITH LCD DISPLAY

From Panasonic comes this fully featured 2-line speakerphone with LCD display, 3-way conference call, volume control for speaker and handset, 24-station one-touch dialer, auto redial, flash, separate ringer tone, line status indicator, memo dial, and save redial, all for only...

$89.95

MODEL KX-T3175
#1745122

GENERAL ELECTRIC
GE We bring good things to life

FOUR LINE SPEAKERPHONE

This deluxe four-line speakerphone is capable of handling up to four lines with a maximum of 16 stations. Its convenient 32 number one-touch telephone memory, along with all station page, intercom, call transfer, busy redial, flash and much more make this the perfect addition to any home or office at just......

$149.95

MODEL 2-9450
#1768637

AT&T

3-LINE SPEAKERPHONE

AT&T's multi-functional centrex compatible 3-line speakerphone comes equipped with page, intercom, 3-way conference, LCD display, 40 number memory, auto line selection, hold, do not disturb function, auto-redial, mute, programmable pause, call transfer, flash, seperate ringer controls, and more, all for only.....

$179.95

MODEL 843
#1853892

COPIERS

Canon

COMPACT COPIER

The size of Canon's compact personal copier makes it perfect for the home or office where space is at a premium. Some of the convenient features of this model includes the ability to copy on both sides of copy sheets, exposure control, and more.
Now just...

$299

MODEL PC-310
#1849208

SHARP

LETTER/ LEGAL PERSONAL COPIER

Compact and lightweight, this Sharp copier weighs only 17.5 lbs. and fits virtually anywhere! Yet, it even lets users make multiple copies up to legal size (81/2" x 14") originals onto a wide range of papers from 81/2" to 4" x 6", allowing an expanded range of applications. Other features include auto exposure.
50 sheet paper tray capacity, auto start function and much more! An excellent value at just.....

$429

MODEL Z-27
#1892837

SHARP

LETTER/ LEGAL COPIER
WITH STATIONARY PLATEN

This durable Sharp copier utilizes a stationary platen, a space-saving feature that eliminates the possibility of the copier bumping into objects while in operation. The variable zoom ratio setting adjusts between 70% and 124% in 1% increments giving you more copying flexibility and versatility. Other features include large capacity 250 sheet tray, continuous copy (up to max. 50), auto start, and letter/legal capacity. An excellent value at...

$699

MODEL Z-85
#1903780

XEROX

COPIER
W/REDUCTION & ENLARGEMENT

If you're looking for versatility and premium performance in a copier your search is over! Xerox has designed a copier that incorporates reduction/enlargement technology enabling you to reduce a copy 75% and 95%, and enlarge to 124%, a 250 sheet paper tray which adjusts to hold memo to letter to legal size paper, built-in automatic exposure which scans documents for degrees of lightness or darkness to determine the appropriate exposure setting, multi-copy capability of 1to 50 copies, letter and legal size copying, and manual bypass, all backed by the experts at team Xerox. Now just...

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MODEL 5011RE
#1706121

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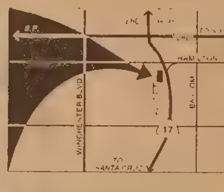

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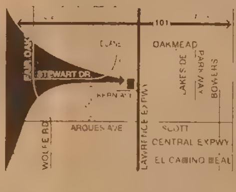

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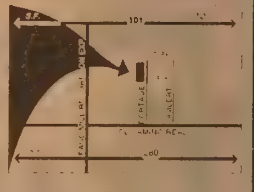

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340 Portage Ave.
(415) 496-6000
(415) 496-6044

FRY'S HAS THE BEST SELECTION OF FAX MACHINES IN NORTHERN CALIFORNIA!

FAX MACHINES

COMPACT FAX MACHINE

This unbelievable value comes equipped with a telephone answering machine interface, 10 number speed dialing, last number memory, polling, on-hook dialing, and remote operation (extension phone transfer to fax) all for only...

$198.99

MODEL FX-40
#1820524

SHARP

FAX

WITH DOCUMENT REDUCTION CAPABILITIES

Sharp's unique time-and paper-saving functions offers several compressions methods to minimize time and paper consumption. The effective size of outgoing documents can be reduced by 20% for faster transmission. And for incoming faxes, it can be set to ignore unprinted areas or reduce documents by 50%. Other features include 50 number memory, 10 page document feeder, 16-level halftone, and much more, all for only...

$249

MODEL UX-104
#1885664

Panasonic

FAX

WITH ANSWERING MACHINE & ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and an anti-curl mechanism, as well as copier capabilities. It's the perfect secretary for your home or business!

$349

MODEL KX-F180
#1877490

AT&T

PERSONAL FAX

WITH ALL DIGITAL ANSWERING MACHINE

Most compact fax machines today have 49' paper roll capacity, but this machine is capable of utilizing a standard 98' roll! It's unique design includes an all digital answering machine (there are no moving parts to wear out or break), a five page document feeder, 12 one-touch dialing numbers and 30 auto dial numbers, on hook dialing, polling and much more for only...

$379

MODEL 7820
#1850844

FAX W/PAPER CUTTER

SHARP

FAX MACHINE

WITH PAPER CUTTER AND DOCUMENT REDUCTION CAPABILITIES

Sharp's unique time and paper-saving functions offer several compressions methods to minimize time and paper consumption. The effective size of outgoing documents can be reduced by 20% for faster transmission. And for incoming faxes, it can be set to ignore unprinted areas or reduce documents by 50%. Other features include 50 number memory, 10 page document feeder 16-level halftone, and much more, all for only.....

$289

MODEL UX-174
#1885686

brother We're at your side.

FAX MACHINE

WITH PAPER CUTTER

Brother's breakthrough fax machine incorporates newly developed therma plus technology which uses fax paper that feels like plain paper and reduces print fading (lasts 3 times longer than thermal paper under normal filing conditions, and you can even use a highlighter!). Other features include, 15 page document feeder, 60 station memory, 16 level grey scale, activity report, polling and much more for only...

$299

MODEL FAX-620
#1896510

AT&T

PERSONAL FAX

WITH AUTO PAPER CUTTER

Perfect for the home or office. This AT&T compact personal fax with auto paper cutter comes equipped with a 5 page document feeder, 12 one-touch dialing numbers and 30 auto dial numbers, on hook dialing, polling, resolution and contrast control, transmission terminal identification, delayed transmission polling and much more, now just...

$379

MODEL FAX-7840
#1850855

Panasonic

FAX MACHINE

WITH PAPER CUTTER AND ANTI-CURL

This fully featured Fax from Panasonic comes equipped with an auto-logic answering system and auto paper cutter, as well as copier capabilities. It's the perfect secretary for your home or business!

$399

MODEL KX-F280
#1886159

PLAIN PAPER FAX

brother We're at your side.

PLAIN PAPER FAX

WITH 256K MEMORY

Brother's done it again! Last year Brother broke the $400 price barrier in paper cutter Fax, and for an encore, Brother has destroyed the $799 stand alone plain paper Fax barrier with this unbelieveable value. Its 200 sheet paper cassette, 30 page auto document feeder, on-screen programming, "smoothing" enhanced image resolution, 48 digit LCD display,multiple resolution transmission, 32 level grayscale, 160 station memory, and Fax/Tel Switch makes this the best value you will find at only.....

$599

MODEL FAX-980
#1801828

SHARP

PLAIN PAPER FAX

WITH 512 KB MEMORY

Sharp's innovative plain paper fax machine comes fully equipped with 512KB (28 pages total, 8 pages receive only, 20 pages receive and /or send) memory provides various functions such as memory transmission for quick return of the original; sequential broadcasting up to 20 stations; substitute reception for out-of-paper situations; and multicopy, with sorting capability, for making up to 30 copies with one pass of the originals. Other features include 15 page document feeder, 50 number memory, and much much more. All for just...

$698

MODEL UX-1200
#1853168

HEWLETT PACKARD
Authorized Dealer

PLAIN PAPER FAX MACHINE

WITH 256 KBYTES OF MEMORY

This plain paper fax offers 256 Kbytes of memory, a 20 page document feeder, 32 gray scale levels, 100 page capacity with easy front reloading, 12 page memory, plus many more outstanding features for only...

$797

MODEL HP-FAX900
#1841819

Panasonic

PLAIN PAPER FAX MACHINE

WITH 20 PAGE MEMORY

The ultimate plain paper fax from Panasonic features a jumbo LCD display, 70 page paper cassette, adjustable letter/legal tray, 32 level halftones, polling, activity reporting, 20 page document feeder, broadcasting to 128 locations, fax transfer, enlargement and reduction copier functions, fax/tel switch, 28-station one-touch dialer, 100-station speed dialer, telephone directory with alpha-search, and much more! Now just.....

$997

MODEL KX-F3000
#1850626

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WOLFE RD
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Tektronix

100MHz DIGITAL STORAGE OSCILLOSCOPE

With the introduction of the TDS 320, Tektronix redefines the low-cost digital oscilloscope. By sampling the signal at five times the analog bandwidth (500 mega samples per second on both channels simultaneously), you can be assured of true acquisitions, free from aliasing or other digital sampling effects TDS 320 is the only scope in its class that can reliably acquire high speed transient or single-shot events to its full bandwidth. The TDS 320 has Dot, Dot Accumulate, Vector, and Vector Accumulate display modes—another advantage over the competiton

$2895

TDS 320
#1878446

Tektronix

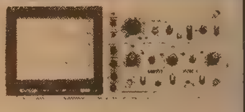
100MHz ANALOG 2 CHANNEL OSCILLOSCOPE

THE TAS 465 brings an advanced level of power and reliability to general purpose scopes. It brings leading edge innovation to low-cost analog scopes with comprehensive features. Comprehensive Video Triggering simplifies triggering on complex video waveforms. With line or field (odd, even, or both) composite video selections and positive or negative sync, you can cleanly trigger on any NTSC, PAL, or SECAM video signal The scopes' dual time base lets you zoom in on any portion of a waveform for closer examination. Auto Setup instantly delivers meaningful waveforms. Pressing the AUTOSET button automatically adjusts the horizontal, vertical, and triggering controls so that a stable signal is displayed.

$1995

TAS 465
#1823505

HITACHI



50Mhz OSCILLOSCOPE

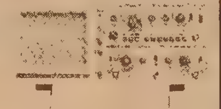
With Single Time Base & High Resolution CRT. The usefullness of Hitachi scopes is extended to cover an array of new measurement applications.
2 channel • 6 inch screen
3 Year Warranty.

$995

V-522
#1746248

GoldStar

20MHz SCOPE W/BUILT-IN FUNCTION GENERATOR

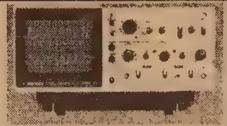


1MHz Function Generator with three kinds of waveforms are available w/50ohm output and TTL Pulse. Two channels- single time base. Ideal for education applications. 1MHz fuction generator built-in this 20MHz, two channel scope. Sine, Square, Triangle and TTL Pulse output waveforms.

$469

OS-9020G
#1734771

HITACHI



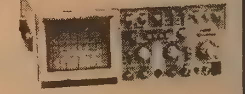
20MHz OSCILLOSCOPE

This lightweight, slim-line scope has become the standard of high performance. Hitachi scopes have earned acclaim from field-serving and maintenance personnel worldwide. 2 Channel, Single Time Base, 3 Year Warranty

$419

Model V-212
#1746237

BK PRECISION
MAXTEC INTERNATIONAL CORP.



20MHz DUAL-TRACE OSCILLOSCOPE

Dual or Single Trace Operation+1mV/DIV Sensitivity
20MHz Response at a true 3DB
Auto/Norm triggered sweep operation with AC TVH TVV and the coupling
x10 magnifier • Bright, sharp rectangular CRT with P3331 phosphor X-Y operation

$389

BK-2120
#155365

THE CHIEF ENGINEER ULTIMATE METER
TRUE Rms - LCR-Hz - dBm
12 INSTRUMENTS IN ONE

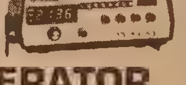
- DC Volt Meter • Audible Continuity Tester
- AC Volt Meter • Frequency Counter 20MHz
- Ohm Meter • Capatance Meter
- DC Current • Inductance Meter
- AC current • Logic Probe
- Diode Tester • dBm

IOMEGA Ohm Impedence • Relative mode
Data hold • Min/Max Average Memory Record
True Rms • Auto sleep • Power off
2 Year warranty
Model 104
#1776719

$249

S.M.S.

BK PRECISION
MAXTEC INTERNATIONAL CORP.



2 MHz FUNCTION GENERATOR WITH DIGITAL DISPLAY

- Generates sine, triangle, square, pulse and ramp waveforms
- TTL Pulse and CMOS Pulse outputs
- Coarse and Fine Frequency Controls
- Variable amplitude output, plus 20dB step attenuator
- Four digit frequency counter display
- Variable DC offset, with on-off switch
- Variable duty cycle; CAL position for 50% duty cycle

$249

MODEL
3011B
#1460267

GoldStar

DC POWER SUPPLY

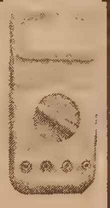
0-30 volts @ 3 amps Continuously Variable.Rugged Construction with Constant Current and Constant Voltage Operation. Overload protection circuit. Output Polarity: Positive and Negative. Low Ripple Voltage Less Than 2mV p-p.

$209

GP-303
#1864678

AMERICAN RELIANCE INC.

3.5 DIGIT DIGITAL MULTIMETER



W/AUTORANGING & 1 YEAR WARRANTY

Model 33 is a versatile digital multimeter with an impressive range of capabilities offered at an incredible price. This unit has data-hold functions and a basic accuracy of 0.5%, also audible continuity and fused 20A input.

$59.95

FREE BOOT W/PURCHASE #1744648

Model 33
#1742347

SL WABER

POWER CONDITIONER

If your equipment suffers from power problems, your company suffers too... SL Waber Has A Solution..

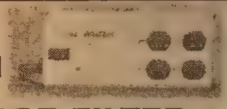
Studies show that over 95% of computer problems are due to brownouts, surges, and damage to circuitry resulting in over-heating, permanent damage, and loss of user time. Since the actual voltage level delivered to your equipment by the utility company may be higher or lower than what is required for safe operation, It's up to you to protect your equipment. Five models feature both undervoltage and overvoltage regulation and range from 300VA to 2400VA. Each model filters out unwanted noise and utilizes SL Waber's® patented 3-stage surge suppression design consisting of metal oxide varistors, gas tube, and silicon avalanche diode, all providing protection against surges up to 72,025 amps!

$92.95

also available
MODEL PC-1800 $224.95

MODEL PC-300
#1791466

WAVE TRACKER™ NOISE AND SURGE FILTER



Waber's new "Wave Tracker" provides the ultimate in noise filtration and surge protection.

- Patented 3 Stage Protection (MOV, Gas Tube, Silicon Avalanche Diode)
- Exceeds ANSI/EEE C62.41-1980 (IEEE 587-1980)
- Audible and Visual Surge Indicators
- NEMA 5-15 Plug and Receptacles
- Lifetime Warranty
- Available in 4, 6 and 8 outlets

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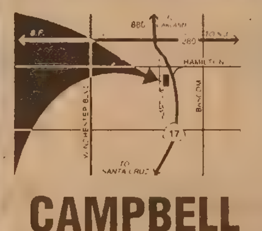

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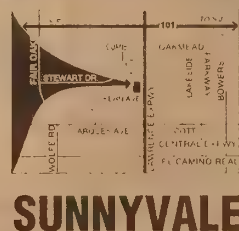

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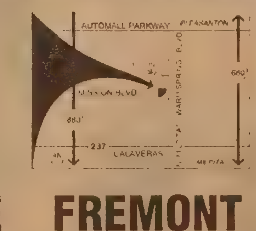

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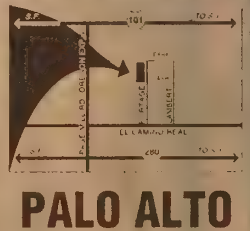

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STATX

ANTI-STATIC FORMULA REPELS DUST

CLEANER AND ANTI-STATIC DUST REPELLENT

6 oz. #1731859

$2.99

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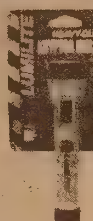

HEAVY DUTY KRYPTON INDUSTRIAL FLASHLIGHT

2AA Batteries included.
#1856471

$3.99

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HALOGEN DESK LAMP WITH TELESCOPING ADJUSTABLE ARM DESIGN

BLK #1912937
WHT #1912948

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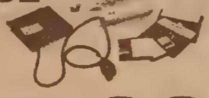
BLOOD PRESSURE AND PULSE MONITOR WITH COMPUTER INTERFACE



200M
IBM #1755848
MAC #1866865

$99.99

GE MT

CT-150 10 BASE-T NETWORK (RJ45) CABLE TESTER

#1908262

$39.99

AKRO-MILS

13" TOOL BOX

- Lift-Out Tray
- Full-Interlocking Hinges
- Fold-Down Recessed Handle
- 13"W x 7"D x 6"H

$4.99

Model 09-013
#1843682

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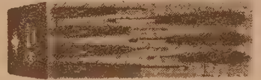

SLOTTED PHILIPS SEVEN PIECE ELECTRONIC TOOL SET

26190 #1738960

$24.99

FOCUS 2001 LASER POINTER PEN

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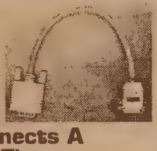
MicroApps PERMANENT POWER PACK™

PREVENT PC FAILURE DUE TO A DEAD BATTERY. Your PC will fail to boot up unless it contains the Patented Permanent Power Pack from MicroApps. Virtually all other PCs have a dying battery which causes real time Clock Failure and Loss of the System Configuration File. Thus, your PC will unpredictably fail to boot every few years. The lifetime guaranteed Permanent Power Pack eliminates the clock battery in IBM PC/AT and most compatibles. Never replace your PC battery again. IC controlled power management system makes your PC more reliable and carries a lifetime warranty.

$32.95

Model PPP-001
#1660638

NEW MAC CABLE



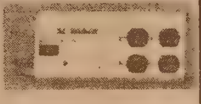
Attention Macintosh Users! The Intellisoft's Intelliview Adapter Connects A Variety of Monitors To The On-Board Video Of Apple's Latest Macs.

- Works with hundreds of inexpensive PC multi-frequency monitors to mimic all of Apple's monitors up to 21" at 1152 x 870.
- Allows easy switching between various resolutions to suit changing needs.

4691V #1800584

$27.99

SL WABER



WAVE TRACKER™ NOISE AND SURGE FILTER

SL Waber's new "Wave Tracker" provides the ultimate in noise filtration and surge protection.

- Patented 3 Stage Protection (MOV, Gas Tube, Silicon Avalanche Diode)
- Exceeds ANSI/EEE C62.41-1980 (IEEE 587-1980)
- Audible and Visual Surge Indicators
- NEMA 5-15 Plug and Receptacles
- Lifetime Warranty
- Available in 4, 6 and 8 outlets

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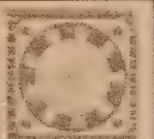

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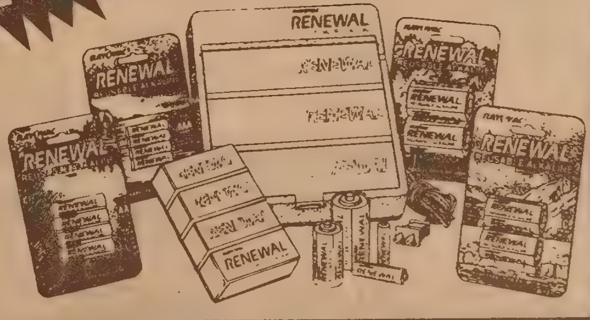

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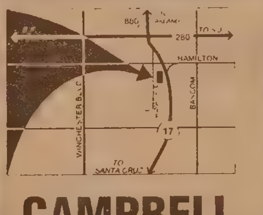

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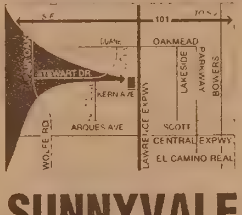

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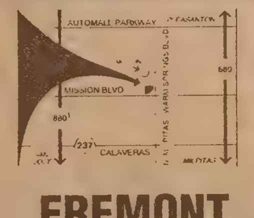

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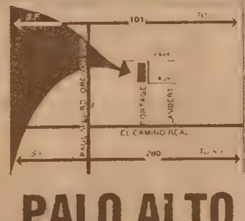

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High-Speed Modems...*continued*

continued from page 171

sure that your communication program allows enough waiting time for the handshake to take place—fifteen to twenty seconds won't do it. You may have to go into your comm program's setup and change the wait time between dialing attempts. Thirty to forty-five seconds should be enough time.

And while we're on comm program settings, the general rule for setting the connect rate is to set the connect speed at the highest possible rate compatible with the modem's line to your own computer, not the advertised speed used to transmit data over the telephone. (The upper limit for most PCs is usually 19,200bps, unless your serial port includes a special UART chip called an NS16550AF. With a high-speed UART, your modem may be able to talk to your computer at 38,400 or 57,600bps.)

Most communications programs let you assign a start-up connect rate, as well as individual connect rates for each dialing menu entry or service profile. These are the settings that you want to bump up to 19,200 or 38,400. If the dialing directory or user profiles in your comm program still specify 2400bps, then you won't connect at a higher rate, even if your initial terminal setting is higher—so change all of those dialing entries!

If the system you're calling can't connect above 2400bps, super-high settings in the dialing entries won't get in the way—you'll still get your 2400bps connection. When the modem at the other end is rated at 9600 or 14,400bps, it talks to your modem over the telephone at those rates. But your modem communicates to your own computer's CPU at the higher rate specified by your comm program.

In addition to the software settings in your communications program, you have hardware settings in your modem to contend with. Unlike older 2400bps modems, high-speed modems contain a number of complicated built-in options that affect the initial connection over the telephone: The default settings in the hardware registers usually tell the modems to begin their negotiations at 2400bps. The modems then proceed to check each other out, attempting to connect at the highest rate permitted by the software.

If your communications program has a "baud autodetect" option, you should disable it for outgoing calls. "Baud autodetect" was fine for switching from 1200bps to 2400bps on your old modem, but your new, high-speed modem has a series of intricate speed negotiation algorithms hardwired into its ROM.

The initial exchange of communication tones over the telephone is called the handshake. If, after the handshake, your modem hangs up instead of flashing a "Connect" message, the settings in the hardware registers may

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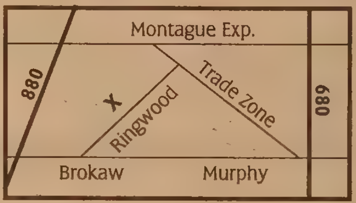

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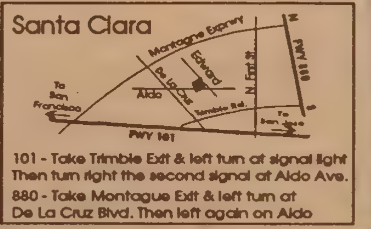

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80C287-12 MHz	35
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be interfering. One trouble spot to investigate is the register setting for the "forced" speed of connection. (This is *not* the same thing as the connect rate specified in your comm program.) If the modem's registers have been programmed to insist upon 4800 or 9600bps in the handshake, you won't be able to connect to a lesser 2400bps host. (See the sidebar for details.)

Your modem can attempt to use a variety of speed protocols and error correction schemes to get a connection. These are controlled by alphabetical register parameters that you can enter into the modem's volatile memory.

Compression Standards And Missed Connections

Currently, V.32 is the most universal standard for modems that communicate at 9600bps and above. (V.32 is a system designed by the International Telecommunication Union—Telecommunication, formerly known as the CCITT.) V.32bis is an enhanced data compression algorithm that causes a 9600bps modem to simulate a higher transfer rate.

The MNP and V.42bis extensions that some modems feature are additional compression and error-correction algorithms. These don't affect the raw bytes-per-second capability of your modem, but they can increase the data transfer rate when connected to modems that don't recognize V.32.

For a while U.S. Robotics offered a protocol in its modems that competed with the CCITT V.32 standard. The USR HST protocol could establish a proprietary connection at 14,400bps to another HST modem. Many BBS systems still employ USR Dual Standard modems that switch between V.32 and HST when they answer a call. If you originate calls with a Dual Standard Modem, and discover that you can't connect to a system at more than 2400bps, the chances are that the handshake between the two modems has been frozen in HST mode. If you switch your modem to the V.32 protocol instead, you may have better luck. (The Hayes command that accomplishes this is ATB0.)

Another common cause of high-speed connection failure is the locking of either the calling or the host modem into an "all-or-nothing" handshake mode. If your modem is configured to hold out for V.32bis compression or for MNP, but the host system doesn't have these features, your modem may hang up instead of completing the call. The key to success is to find the register settings for your modem that says: "If the host system isn't as well-endowed as we are, please fall back to a less robust connection standard, or use a lower bps connection rate."

continued

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NETWORTH Hubview v2.1	733
Hubview for NMS	733
NOVELL Lanalyzer for Windows v2.1	1,055
NetWare Management System	1,692
NetWare Management Agent (Single)	338
NetWare Management Agent 20-pack	5,382
NetWare LANalyzer Agent v1.0 (Single)	1,008
NetWare LANalyzer Agent (Multiple Segment)	1,692
SABER Lan Workstation 1st node/add 1	129/39

Repeaters

TUT Systems XL1501 (Single unit)	1,029
XL1502 (2BNC/2RJ11)	1,448
XL1503 (1BNC/1RJ11/1AUI)	1,086
XL1504 (4BNC/4RJ11/1AUI)	2,897
XL600+ 600' Repeater (1 Pair)	500

XL Series repeaters allows connection of lans over 1500' w/ standard phone wire.

Dual Port Repeater BNC/BNC	293
Quad/Octo Port Repeater (4 BNC/8 BNC)	440/809

Tape Backup Solutions

CHEYENNE ARCserve v5.01 NLM 5/10	254/510
ARCserve v5.01 NLM 25/50 users	890/1,082
ARCserve v5.01 100/250 users	1,181/1,536
ARCserve v5.01 500/1000	2,982/5,934
MacAgent/SCO Unix Option	330/337
Changer Option for v5.0	465
Stacker Option	470
PALINDROME Backup Director NLM	569
Network Archivist NLM	1,224
Expansion Module (Doubles Capacity)	576
Archivist Autoloader	575
Archivist Enhanced Autoloader	1,445
LEGATO NetWorker (Single Server)	555
COLORADO Power Tape 1.1GB w/o Ctrl	650
Power Tape Int. 2GB SCSI Tape Drive w/Ctrl	1,055
Power Tape Ext-25 2 GB SCSI Tape Drive w/Ctrl	1,251
Power Tape 50-4 GB SCSI Tape Drive w/Ctrl	1,664
Power Tape Ext 50-4 GB SCSI Tape Drive w/Ctrl	1,870
CONNER Backup Exec NetWare 3.X/4.X NLM	658
Conner 7251QI 500 MB w/Ctrl	529

Bridges/Routers

3COM NetBuilder Local Ethernet	3,637
NetBuilder Remote	5,146
ROCKWELL NetHopper NH-1	1,316
NetHopper NH-3	2,248
NetHopper NH-P	1,118

Network Modems/Comm. Servers

GATEWAY Lan Expander 1-port/4-port	624/1,235
Lan Access 4MB/8MB	1,391/1,542
MICRODYNE ACS for NetWare Connect	
ENET 4 ports w/ modems/ w/o modems	5,647/4,127
ENET 8 ports w/ modems/ w/o modems	CALL
MICROTEST Ethernet LANModem	1,439
NOVELL NetWare Connect 2/8/32 pts	415/1,583/4,077
SHIVA Net Modem/E 9600 BNC	1,567
Lanrover 4E/8E ports w/o modems	2,346/3,145
U.S. ROBOTICS Modem Sharing Kit V32BIS	532
Dual Modem Sharing Kit	937
Shared Access CommServ	1,495
MICROCOM DeskPorte Fast ES 28.8 Fax/Modem	299
DeskPorte Fast EP 28.8 Fax/Modem	399
MOTOROLA DDS/MR56 V.35 or RS232	514
SW 56 II 4-Wire RS232/v.35	639/799

Network Printing Solutions

CASTELLE Jetpress XIO BNC/10Base-T	381
Jetpress MIO for HP4/MIO PLUS	349/451
LANPress 10BT (1 PAR)	313
LANPress THIN/10BT (1PAR/1SER)	362
LANPress THICK/10BT (2 PAR/2SER)	512
DIGITAL PROD. NetPrint/150E 3 Parallel Ports	638
Jetxprint MIO for HP4	346
EAGLE NPE400 1 LPT, BNC & 10BT	292
HEWLETT PACKARD JetDirect 10BT	340
JetDirect Combo BNC/10BT	452
JetDirect Token Ring	562
INTEL Netport EL for Ethernet	427
Netport EL for Token Ring	588
NetportExpress XL for Ethernet	475
Netport Express XL for Token Ring	660
MILAN Fastport 1P/1S, BNC/10BT	459
XIRCOM Print Server 1 LPT, BNC /10BT	300/333
Token Ring Print Server	580

Network Fax Solutions

CASTELLE FaxPress 1000, 10BT/BNC	1,576
FaxPress 2000 2-Line/4-Line	2,693/3,493
CHEYENNE FaxServe NLM 5/250	259/1,116
FaxServe NLM 500/Unlimited	1,972/3,207
OPTUS FACSys Fax Software/Multi-Server	720/1,624
INTEL Satisfaxtion Modem 200/400	244/315
Net Satisfaxtion for 8 fax boards (20 users)	649
Net Satisfaxtion (1000 users)	1,040
DELRINA Winfax Pro for Networks (Server)	125
10/25/100 Users	608/1,350/3,042
Starter Kit (1 Server, 2 nodes)	270

Network CD-ROM

MERIDIAN CD-Net for DOS v4.31 (10 Users)	467
CD-Net for DOS v4.6 (10 Users/WAN)	648
CD-Net for NetWare (NLM-10 Users)	467
CD-Net for NetWare (100 Users)	938
CD-Net for NetWare (250 Users)	1,445
MICRO DESIGN SCSI Express for NetWare, MDI	558
SCSI Express for NW3.X, Non-MDI(20 Users)	910
SCSI Express for NW3.X, Non-MDI(250 Users)	1,332
CD-Rom LaserBank 600CD Ext. Sin./Dual	558/1,117
Discport Ethernet/Token Ring	599/799

Uninterruptible Power Supplies

APC BACK-UPS 250/400/450	140/175/210
BACK-UPS 600/900/1250	289/422/561
POWERCHUTE PLUS for Novell/Unix	99/149
SMART-UPS 400/600/600RM/900	310/375/470/589
SMART-UPS 1250/1250RM/2000RM	736/869/1,376
MATRIX 3000 (3000 VA)	2,784
MATRIX 5000 (5000 VA, *Up To 24 hrs Uptime*)	4,137

Cable Testers & Supplies

RG58 & RG62 Rachet BNC Crimper	45
RJ-45 Crimper	45
RG58 Ethernet BNC-Crimp (100 pak)	125
RJ45 10 BaseT Connectors (100 pak)	40
10Base-T Cable (1000' min) LV3/LV 5	100/200
BELDEN PVC RG58 or RG62 Cable (1000' min)	175
PLENUM RG58 or RG62 Cable (1000' min)	350
MICROTEST Quick Scanner	607
MT310 TP/COAX Scanner	1,142
MT350 Value Kit	1,877
MT350 NEXT Scanner	2,525
Penta Scanner	2,914

Novell Software

Lan WorkPlace for DOS Single/10 Users	290/1,445
Lan Workplace for Mac Single/10 Users	289/1,437
Lan WorkGroup-5/10/20 Users	1,125/1,866/2,613
NetWare for Mac v3.12 200 Users	685
NetWare for Mac v4.0 Unlimited	851
Multiprotocol Router/Router Plus	720/1,032
NetWare NFS Single/5-pk	3,374/10,537
NetWare NFS Starter Kit	1,065
NetWare NFS Gateway 5/10 User	1,069/1,797
Global MHS v2.0 20 Users	358
Global MHS v2.0 50/100 Users	648/1,064
MHS v1.5 Network Edition 10 Users	140
MHS v1.5 Network 50/100 Users	504/733
MHS Multi-Network Edition 10 Users	140
MHS Multi-Network 50/100 Users	504/733
MHS Personal Edition	100
NSE Pro (NetWare Support Enc.) Subscription	500
Personal NetWare Single/5-Users	89/290
DOS 7	89

E-Mail

cc:MAIL DOS Platform	214
OS/2, Windows or MacIntosh Platform	359
Unix Platform	834
10 User license/25 User/100 User	250/612/2,387
Group Pack 10-pack DOS/WIN	656
Mobile/Remote	151/210
Remote Import/Export	95
Router	942
Link to SMTP/Link to UUCP	2,592/384
MICROSOFT PC Mail Server + 10 Users	485
PC Mail 5/20/100 Users	273/930/3,633
MHS Gateway/PROFS	708/3,405
SMTP/X400 Gateway	3,405/3,405
FAX Gateway	1,419

Network Utilities

BRIGHTWORKS Utilities for NetWare	359
Fusion Software 100-User	1,164
Automatic Inventory 100-User/250 User	534/763
CENTRAL POINT Anti-Virus for NetWare	889
Xtree Tools for Networks/Server Extension	565/442
Xtree Xtnet for NetWare	387
CHANTAL RAID (Software Only)	640
CHEYENNE InocuLAN (20/250 workstations)	326/655
Utils for NetWare 286/386	257
COREL Network (RAID/CDROM/OPTICAL sw)	420
DIRECT ACCESS Network Menu	425
FUNK App Meter	464
FRYE Early Warning System or Lan Directory	339
INTEGRA Oasas RAID (Software Only)	535
INTEL LanDesk Virus Protect (Single)	696
LanDesk Virus Protect 4-pk/20-pk	2,070/6,757
LOTUS Notes Starter Pack for Netware	959
MCAFEE NetShield	655
MICROTEST Lan Assist/Map Assist	265/360
SYMANTEC Norton Admin. 5/10 Users	247/438
Norton Admin. 25/50/100 Users	1,068/2,028/3,680

Peer-to-Peer Networking

ARTISOFT LANtastic 6.0 Network Starter Kit	375
LANtastic 6.0 Add-On Kit Coax/10BT	170
LANtastic 6.0 Software Single/5-User	99/354
LANtastic 6.0 Software 10/25 Users	637/1,272
LANtastic 6.0 Software 50/100 Users	2,118/3,460
Noderunner/SI Coax or TP	124
Noderunner/SI Combo	154
Noderunner/SI Coax/TP (5 pack)	423/440
Lantastic for MAC	589
Lantastic for TCP/IP Single/5 Pk	220/883
MICROSOFT Windows for Workgroup V3.11	159
WFW V3.11 Add-On for Windows 3.1	69
WFW Starter Kit (Software/Hardware for 2)	399
NATIONAL SEMI Personal NetWare Starter Kit	260
One Station Expansion Kit	161

RAID 5 SERVER SUB-SYSTEMS

Subsystems include one 4mm DAT tape drive w/Server NLM, 1 networkable CDROM drive w/ Server NLM, & RAID-5 storage from 2 GB w/ RAID 5 NLM, monted in individual ext. chassis. Add a SCSI adapter to complete configuration.

Adaptec 1540ISA/2740EISA/1640MCA	285/399/333
2 GB, 3 1GB drives, 10ms	5,461
3 GB, 4 1GB drives, 10ms	6,530

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3C509 TP Etherlink III as low as	$83
Ethernet SuperBundle	$1,080
Token Ring SuperBundle	$4,100

FastLink/ 3Com

Networking Super Bundle

All bundles include 3Com's Ethernet Super Bundle as described above, five 10 BaseT cables & corresponding networking software. 10 User bundles include 10 cables and 10 lan cards.

Novell Personal NetWare 5 Users	$1,421
Lantastic 6.0 5 Users	$1,484
Lantastic 6.0 10 Users	$2,217
Novell NetWare 3.12 5 Users	$1,748
Novell NetWare 3.12 10 Users	$2,924

NETWORTH CONCENTRATORS

NetWorth

Series 2000 Snappable 16-port Hubs: The Next Generation of Stackable Hubs-Simpler, Smarter, Snappier. Hub-to-hub connection is a "snap" by simply plugging in a standard twisted pair RJ-45 cable into the hub expansion ports allowing up to 10 Snappable Hubs (160 ports) to be connected within a 250 foot range. The entire stack still act as a single repeater and every snappable hub is fully SNMP manageable to simplify network management and design.

16-port Snappable Hub	$930
16-port SnapNet Bundle (1 Hub/5 Nics)	$1,267
16-port SnapView Bundle (1 Hub/HubView)	$1,296
48-port Snappable Bundle (3 Hubs)	$2,603

NetWorth's Tri-Segment Hubs provide high performance, low cost connectivity for NetWare LANs. Through its distributed segment architecture, each hub can be separated into three 8-port groups, with each group assigned to a separate segment.

Tri-Segment Stackable 24-port w/Mgmt	$2,041
Tri-Segment Stackable 24-port w/o Mgmt	$1,288

Networth's Series 4000 hub features built-in multiple backplane capability for Ethernet, Token Ring, and FDDI connectivity and can support up to five separate 10Mpbs segments.

3/6/10 Slot Chassis	$677/935/2,081
Multi-Segment 24-port Module w/Mgmt	$2,554
Multi-Segment 24-port Module w/o Mgmt	$1,655
Multi-Segment Management Module	$899

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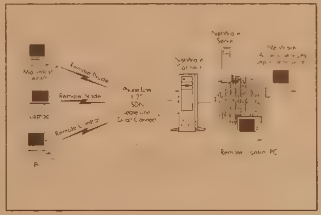
NOVELL NETWARE CONNECT

Building A Flexible Communications Server With Novell NetWare Connect

Novell NetWare Connect is a software based communications solution for NetWare LANs. It allows inbound/outbound modem communications including remote login and remote control. Using NetWare Connect, users on a network can dial out to services such as Compuserve, BBSs, & Internet providers. Remote users can dial in from field offices or their homes and get full access to all NetWare services. With the addition of FaxServe from Cheyenne Software, NetWare Connect can also be used for inbound and outbound fax services. Available in 2-64 port configurations. For future expansion, this platform also supports the addition of Novell MultiProtocol Router.



Ports	Bundled Price
2	$1,089
8	$4,607
32	$5,614

Prices include NetWare Connect, v.fast 28.8 modems, and Digiboard I/O board. 32-port version does not include modems. Server not included.

HEWLETT PACKARD CHEYENNE EXABYTE

Buy a Hewlett Packard JetStore 5000 4mm DAT tape drive with the award-winning Cheyenne Arcserve NLM for Windows software and receive a FREE 4mm Cleaning Kit and a DAT tape! HP is the worldwide leader in DAT market with over 46% of the market. DAT technology provides high performace combined with high reliability to give you the optimum backup medium. With DDS2 compression, you can backup up to 16 MB on a single DAT tape.

Another winning combination is the Exabyte 8mm tape drive and Cheyenne Arcserve NLM for Windows. The EXB-8505 8mm tape drive offers 5GB of native capacity, and up to 10 GB of storage using hardware data compression.

For NetWare 3.1X or 4.X:

	4-8 GB DDS	8-16 GB DDS2	5-10GB
5 Users	$1,579	2,072	2,864
10 Users	$1,822	2,314	3,107
25 Users	$2,238	2,731	3,523
50 Users	$2,369	2,862	3,654
100 Users	$2,477	2,970	3,762
250 Users	$2,897	3,390	4,182

SPECIAL OFFER!
Purchase a HP Jetstore 5000 and get a 4mm cleaning kit and a DAT tape FREE!

FLY FREE WITH SMC

Get a free round-trip American Airlines flight voucher for travel anywhere within the 48 contiguous United States and Canada when you purchase three 6-packs or one 24-pack of SMC Elite Ultra Ethernet adapters.
OR
Buy three SMC Elite Ultra 6-packs, get one 6-pack FREE!
Buy one SMC Elite Ultra 24-pack, get one 6-pack FREE!

SMC Elite Ultra 6-pack Coax or TP	$632
SMC Elite Ultra 24-pack Coax or TP	$2,371
SMC Elite Ultra Combo 6-pack	$728
SMC Elite Ultra Combo 24-pack	$2,693

Offer good thru June 30, 1994, Offers cannot be combined.

NOVELL

25% Discount on NetWare Upgrades !

Take advantage of Novell's limited time offer for a NetWare upgrade.

Up through the month of July, 1994, NetWare 3.12 and 4.01 upgrades will be offered at 25% off the list price.

*Upgrade from NetWare 2.2 starting from $335.**
Upgrade from NetWare 3.11 starting from $225.

Top Reasons To Upgrade:

- *Take advantage of promotional pricing*
- *Increase user connectivity*
- *Use advanced printing services*
- *Take advantage of new applications and services to maximize network performance*

** Note: NetWare 2.2 users-Novell will be discontinuing sales and support for NetWare 2.2, so now is the time to consider an upgrade.*

Call today for promotional pricing on upgrades!
Offer good thru July 31, 1994.

NETWORK CD-ROM STARTER KITS

MICROTEST

An easy way to share CD-ROMs on your Thin Ethernet or 10BaseT network. Attach up to 7 CD-ROMs to one Discport. Comes complete with DiscView software for easy installation.

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Discport	$599

PLEXTOR

Combine the Microtest Discport with Plextor CD-ROM drives to provide the total networkable CD-ROM solution!

Discport w/Plextor Ext. CD-ROM	$1,026
Discport w/4-Unit CD-ROM Solution	$2,598
Discport w/7-Unit CD-ROM Solution	$3,922

digital

Digital's EtherWORKS 3 TURBO family of ethernet cards is the new price/performance leader designed for real world networks. With parallel processing and shared memory architecture, the EtherWORKS 3 TURBO family continues to deliver great performance as your network grows.

For a limited time, buy 4 EtherWORKS 3 adapters and get one FREE!

DE203-AB Turbo 10BaseT w/128KB	$127

PCMCIA LAN ADAPTERS

Connect your portable computer to an Ethernet or Token Ring LAN via the PCMCIA slot. These leading manufacturers offer the accessibility you need to link up to your network.

3COM 3C589 Etherlink III 10BT	$262
3COM 3C589 Combo 10BT/Coax	$315
IBM 10BaseT or Coax Adapter	$261/$242
IBM Token Ring Adapter	$480
National Semi Ethernet Adapter	$189
Xircom Ethernet Adapter	$228
Xircom Ethernet PCMCIA + 14.4 Modem	$549
Xircom Token Ring Adapter	$580

The specific registers that control fall-back and renegotiation vary from manufacturer to manufacturer. Some brands do this with a series %Q settings. Other brands use the S37, S38, and S110 registers.

The &Nn parameter is another potential source of trouble. Settings of &N1–&N7 may lock the modem into a minimum bps rate for a handshake higher than the host system can accept. Use &N0 to establish a handshake with the host at 2400bps. Then the modems can negotiate with each other for a higher connect rate.

High-Speed File Transfers

So, okay, you've managed to establish a high-speed connection with a host system. But when you try to upload or download files, your communications program is still timing out—file transfers freeze, or you may get a stream of error messages on the screen. This is particularly common if you run the connection in a PC multitasking environment like DESQview, Windows, or OS/2. This is where plugging an NEC 16550AF UART into your serial port can change your life!

RESOURCES:

TurboCom/2, $29.95
Pacific CommWare
180 Beacon Hill Ln.
Ashland, OR 97520
(503)482-2744

Winfax Pro/Communications Suite
Delrina Communications
6830 Via Del Oro, Ste. 240
San Jose, CA 95199
(408)363-2345

You can often banish file transfer errors and improve data throughput above 9600bps by changing the UART chip attached to your serial port. PC serial cards usually include a UART chip called an 8250 or 16450. This main chip is accompanied by two smaller chips called 1488 and 1489. If these chips are socketed instead of soldered into the serial card, they can be replaced with the NS16550 chip set for a cost of $10 to $15. If the chips are soldered in, you may need a high-speed serial card replacement (available from discount houses like Fry's for about $60).

The 16550AF upgrade is well worth the money. The new UART chip includes a built-in 16-byte data buffer that dramatically affects high-speed file transfers in multitasking environments. Most state-of-the-art communications programs automatically turn on the data buffer (referred to as FIFO). If you have an older communications program, you may need a freeware or shareware FIFO utility to turn on the buffer. (These are readily available on CompuServe or public bulletin board systems.)

Users who run telecommunications programs under Windows may need to take one additional step to cure the data over-

Exploring your modem's registers

All Hayes-compatible modems include a series of register commands that govern the modem's behavior. These can be typed in from the online terminal screen in your communications software.

The prefix "AT" calls the modem to attention. If everything is set up correctly, when you type "AT" and press ENTER, the modem will return an "OK" prompt. When you type "ATDT" followed by ENTER, you should get a dial tone. (If you have a "pulse dial" telephone system, type "ATDP.")

In addition to the basic "AT" dialing commands, there are usually settings prefixed by the "&" and "%" signs, plus a set of "S-register" defaults, set by the string ATS(n)=xx. For example, if you type ATS7=? from the terminal screen, the modem will return the numerical value for register S7 (usually 000). If you type ATS11=70, the numerical value of the S11 register will be changed to 70.

To make a setting change permanent, you may issue the command AT&W.

The command AT&F restores the modem's original factory settings, erasing whatever changes may have been written to volatile memory.

AT&V will usually produce a screen dump showing the current register settings, plus the defaults saved in memory. (This command is ATI4/ATI5 on older USR Courier modems.)

Once you have a display of the modem's internal register settings, you can consult the manual to determine what the individual parameters do. Although the specific registers may vary from manufacturer to manufacturer, the general logic of the commands is similar.

The following are some of the more standard commands (check the manual that came with your modem for equivalents):

AT&Bn—Set the speed at which serial port talks to the modem (called DTE). Usually AT&B1 tells the port to heed your comm program's high-speed settings, rather than fluctuating with the host system's rate.

AT&Nn—Select variable or fixed connection rates. (Should be set to AT&N0 to negotiate connection at a variety of speeds. &N1–&N7 may force a connection at a rate higher than the host system can provide.)

AT&Mn—Enable/disable MNP error-correction/compression. (Should be set to AT&M0 for low-speed modems that are incompatible with MNP.) (The WELL's 2400bps line is a prime example of this.)

AT&Dn—Force on the Data Terminal Ready (DTR) signal. (Try setting AT&D0 if you experience sudden hangups during file transmission.) The usual setting is AT&D2.

AT&Hn—(May be &Kn on some modems.) Enables/Disables Transmit Data flow control. Should be disabled with setting of AT&H0 on some low-end Macintosh systems.

AT&H1—Enables hardware CTS flow control.

AT&Rn—Enables/disables RTS Hardware flow control of received data. (Should be set to AT&R1 to disable hardware flow control on some low-end Macintosh systems.) Normally set to AT&R2 to enable flow control.

ATS110=n —Enable/disable V.32bis for V.32-compatible modems. (Try ATS110=0 if you can't connect to a picky V.32 modem which lacks the additional bis protocol.)

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486DX/40	$1025

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- FREE Hi-Res Mouse

486/DX-33	$1125
486DX2-50	$1225
486DX2-66	$1265

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- VLB Accelerator Graphic Card
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- 101 Enhanced Keyboard
- Double Speed CD ROM
- 16 Bit Sound Card
- Amplified Stereo Speakers
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- FREE Hi-Res Mouse

486SX/33	$1295
486DX-33	$1355
486DX/40	$1415
486DX2-50	$1485
486DX2-66	$1545

BUSINESS PACK:
Microsoft Bookshelf MPC
Microsoft Works MPC
Comptons Encyclopedia

FAMILY PACK II:
Compton's New Century Encyclopedia
Mayo Clinic Family Health Book
3D Animation Bank
Family Zoo, Animals Encyclopedia

CHILDRENS PACK:
Macmillan Dictionary for Children
Arthur's Teacher trouble
Mixed-Up Mother Goose
Dinosaur Encyclopedia

GAME PACK:
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Lord of the Rings
Kings Quest V
F-15 Strike Eagle III

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- PCI Onboard SCSI Controller
- 2S, 1P, 1G Ports
- PCI Accelerator Graphics Card
- 14" Low Radiation 72 MHz Monitor
- Mini Tower Case & 230W P.S.
- 101 Enhanced Keyboard
- FREE Hi-Res Mouse

486DX/33	$1595
486DX2/50	$1695
486DX2-66	$1775

Pentium PCI

- Intel Pentium 66 MHz CPU
- 8 MB RAM, 256K Cache
- Teac 1.44 Floppy Drive
- 540 MB IDE HDD
- PCI IDE Controller
- Hi-Speed 2S/1P/1G Ports
- 2 MB Accelerator PCI Graphics Card
- 15" Low Radiation Digital Monitor
- 101 Maxi Keyboard
- Medium Tower Case w/250W PS
- FREE Hi-Res Mouse

ASUS	$2595
GENOA	$2625
MICRONICS	$2825
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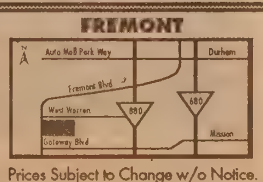

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run/timeout blues. The original communications driver for Windows 3.1 is the cause of most file transfer problems. It simply is not designed for high-speed communications.

Sophisticated Windows communications packages replace the native Windows driver with a new one. (Pacific CommWare markets a package called TurboCom. Delrina's Winfax Pro includes a special driver called WFXCOMM.DRV, which is also available for public download in their CompuServe forum. Other replacement drivers can also be found on public bulletin board systems.)

You can often banish file transfer errors and improve data throughput above 9600bps by changing the UART chip attached to your serial port.

When you obtain a substitute communications driver, copy it to the \WINDOWS\SYSTEM directory and change the following parameter in Windows' SYSTEM.INI file:

[boot] ... Comm.drv= [type in the name of the new driver]

Macintosh Concerns

Macintosh owners should be wary of the serial cable provided by the modem manufacturer. Try to determine from the vendor whether the cable can carry the Hardware Handshaking (DTR) signal to the modem (connection through pin-7/GPi). Enabling System 7's 32-bit mode and disabling Virtual Memory may overcome other problems.

The Classic and some of the older Mac models can't monitor the hardware Data Terminal Ready (DTR) signal. Typing in the command AT&D0 from the terminal screen may avoid unexpected modem hangups during file transfers.

Beyond 14,400bps

The newest modems available on the marketplace are capable of connect speeds up to 28,800bps when they use proprietary connection schemes. Currently, the 28,800bps V.fast modems from different manufacturers are incompatible with one another. What this means is that a modem manufactured by one vendor may not be capable of connecting above 14,400bps to a modem from another vendor. This is analogous to what happened several years ago with U.S. Robotics' 14,400bps HST modems. Eventually their HST protocol was eclipsed by chips programmed for V.32 and V.32bis connections.

A group of vendors spearheaded by AT&T has developed a protocol called V.32terbo that supports data transfer rates of 16,800 and 19,200bps. Since V.32terbo doesn't require a faster processor to implement, it is currently being offered as a low-cost add-on to existing V.32bis products.

Both AT&T's V.32terbo and Rockwell's V.fast will probably be superseded by the V.34 standard currently under construction by the ITT-T. V.34 modems are not yet widely available, but you'll probably start seeing ads for them in *MicroTimes* within the next several months. ■

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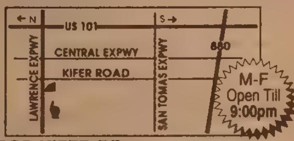

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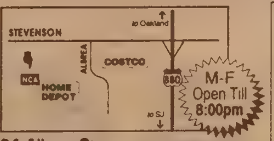

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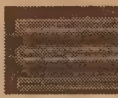

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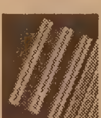

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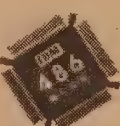

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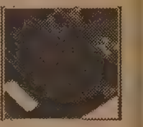

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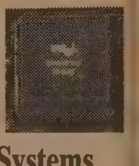

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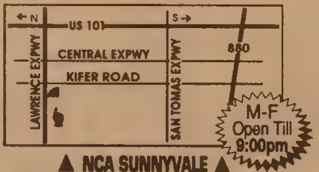

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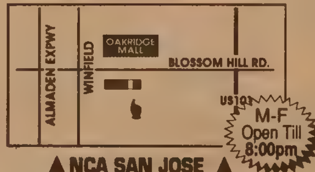

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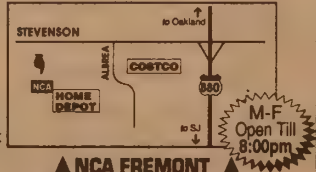

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Two VESA Local Bus Slots
ZIF Expansion Slots
High speed Serial Ports UARTs
2FD / 2HD Card up to 2.88M support
Teac 1.44 or 1.2M Floppy Drive
Focus 8000 Extended Keyboard
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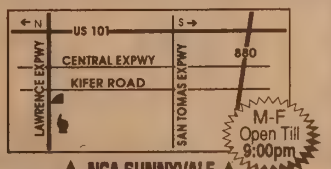

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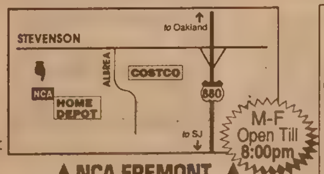

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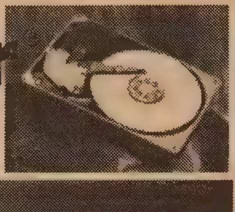

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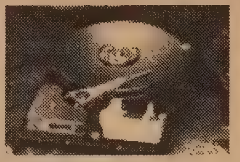

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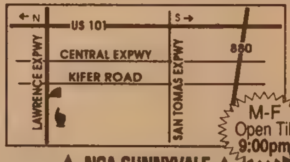

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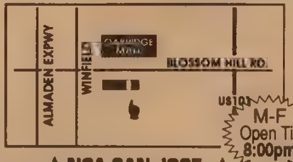

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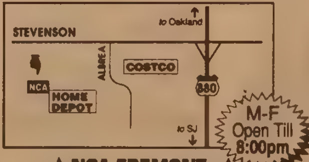

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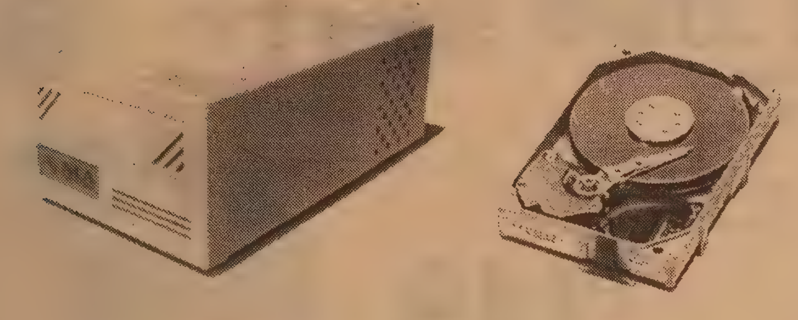

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170MB	GLS170AT		17ms	2.5"X17mm	$279
256MB	GLS256AT		17ms	2.5"X19mm	$349
170MB	ELS170A	32K	17ms	3.5X1"	$179
270MB	**LPS270A**	**128K**	**12ms**	**3.5X1"**	**$229**
340MB	**LPS340A**	**128K**	**Fast**	**3.5X1"**	**$258**
540MB	**LPS540AT**	**128K**	**12ms**	**3.5X1"**	**$369**
730MB	**Lightning 730**	**128K**	**11ms**	**3.5X1"**	**$599**

SCSI

CAPACITY	M/N		SPEED	SIZE	PRICE
170MB	GLS170S	FOR MAC POWERBOOKS	17ms	2.5"X17mm	$289
256MB	GLS256S		17ms	2.5"X19mm	$359

CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
170MB	ELS170S	32K	17ms	3.5X1"	$199	$329
270MB	LPS270S	128K	12ms	3.5X1"	$279	$389
340MB	LPS340S	128K	FAST	3.5X1"	$299	$409
540MB	LPS540S	128K	12ms	3.5"X1"	$399	$509
540MB	EMPIRE	512K	9.5MS	3.5"X1"	CALL	CALL
1.0GB	PD1080S	512K	9.5ms	3.5"X1"	$729	$839
1.2GB	PD1225S	512K	10ms	3.5"	$899	$1019
1.8GB	**PD1800S**	**512K**	**10ms**	**3.5"**	**$1049**	**$1159**

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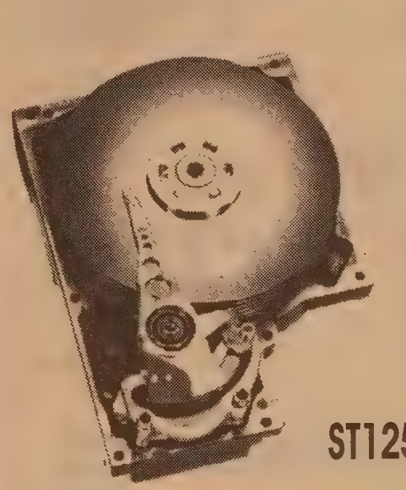

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- ▶ Fast SCSI-II
- ▶ 500,000MTBF

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IDE

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245MB	ST3283A	128K	12ms	3.5"X1"	$269
263MB	ST3290A	64K	16ms	3.5X1"	$249
341MB	ST3391A	256K	13ms	3.5X1"	$319
452MB	ST3550A	256K	12ms	3.5X1"	$339
528MB	ST3600A	256K	10.5ms	3.5X1"	$499
130MB	ST9145AG	64K	16ms	2.5" NOTEBOOK	$269
209MB	ST9235AG	64K	16ms	2.5" NOTEBOOK	$329

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CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
344MB	ST3390N	256K	12ms	3.5"x1"	$349	$459
456MB	ST3550N	256K	12ms	3.5X1"	$369	$479
525MB	ST3600N	256K	10.5ms	3.5X1"	$389	$499
1.05GB	ST11200N	256K	10.5ms	3.5"	$789	$899
1.0GB	**ST31200N**	**256K**	**9ms**	**3.5"x1"**	**$739**	**$849**
1.4GB	ST41651N	256K	15ms	FH	$1099	$1299
1.7GB	ST11900N	256K	9ms	3.5"	$1099	$1219
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2.9GB	ST43401N	512K	10ms	5.25	$2199	$2499
4.3GB	ST1510N	7200RPM	8ms	5.25	CALL	CALL
9.0GB	ST410800N	512K	11.5ms	5.25	$4599	$4799

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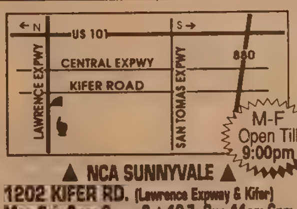

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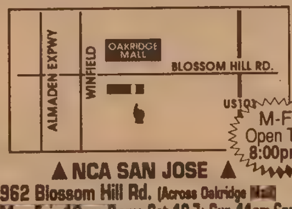

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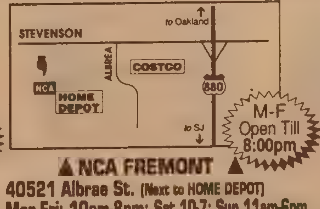

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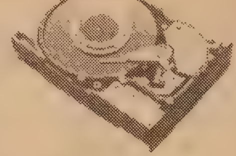

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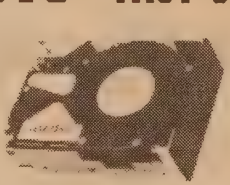

$979

EXTERNAL...$1089

IDE

	MODEL	RPM	SPEED	SIZE	INTERNAL
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1.75GB	MC2217A	5400	10ms	3.5"	$979

SCSI

	MODEL	RPM	SPEED	SIZE	INTERNAL	EXTERNAL
1.0GB	MC2210	5400	10ms	3.5"	$759	$869
1.0GB	MC2210AV	Audio/Video			$899	$1029
1.05GB	MC4110	5400	8.5ms	3.5"	$749	$859
1.4GB	MC1908	5400	11ms	FH	$1249	$1449
1.75GB	MC2217	5400	10ms	3.5"	$979	$1089
1.75GB	MC2217AV	Audio/Video			$1199	$1329
1.8GB	MC1548	3600	14ms	FH	$1499	$1699
2.0GB	MC1926	5400	11ms	FH	$1599	$1799
3.0GB	**MC1936**	**5400**	**11ms**	**FH**	**$2199**	**$2399**

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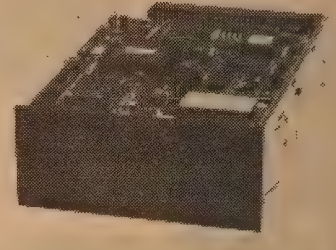

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IDE

CAPACITY	M/N	CACHE	SPEED	SIZE	PRICE
350MB	M2682T	256K	14ms	3.5"	$299
530MB	M2684T	256K	14ms	3.5"	$379
520MB	M2624T	64K	12ms	3.5"	$399

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CAPACITY	M/N	CACHE	SPEED	SIZE	INTERNAL	EXTERNAL
240MB	M2637SA	Notebook	11ms	3.5"	$359	N/A
1.0GB	M2694ESA	256K	10ms	3.5"	$749	$859

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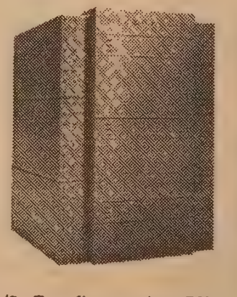

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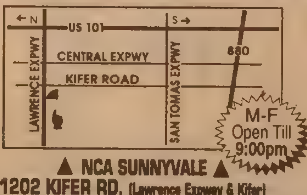

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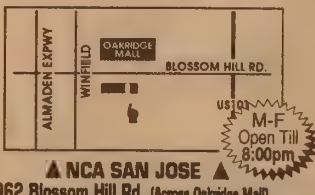

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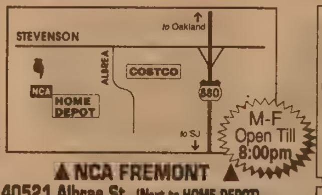

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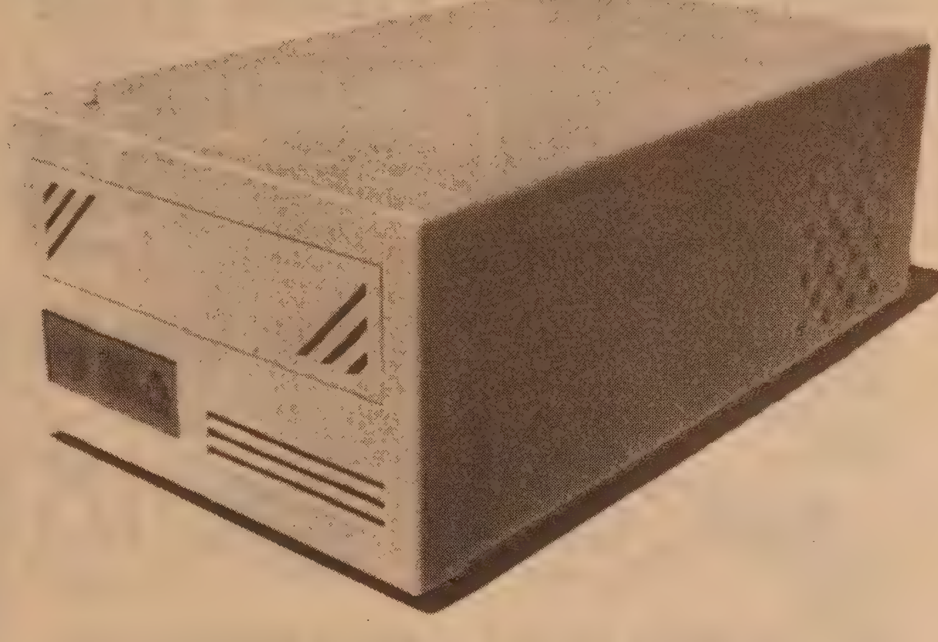

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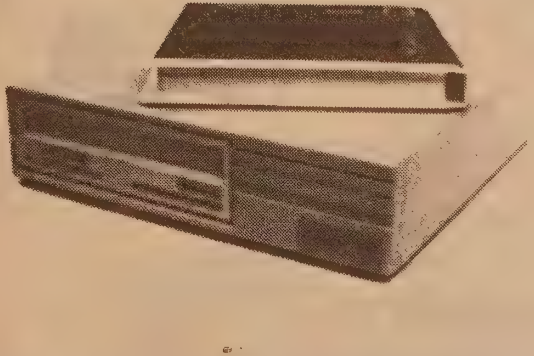

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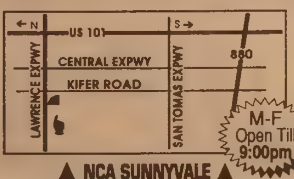
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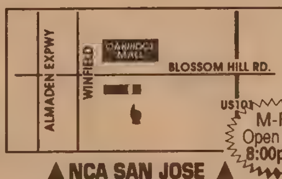
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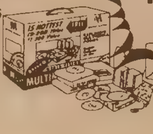

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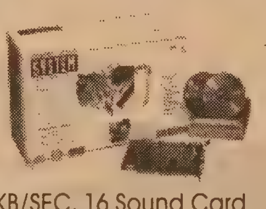

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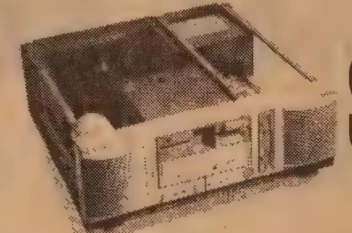

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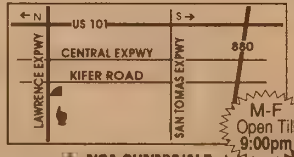

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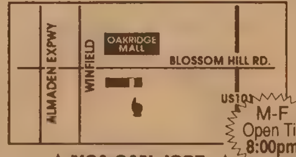

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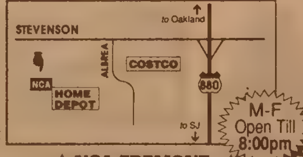

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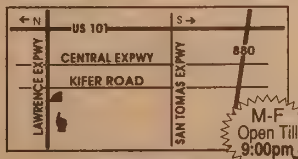

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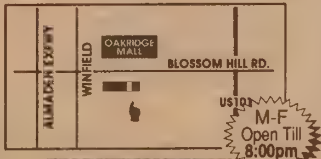

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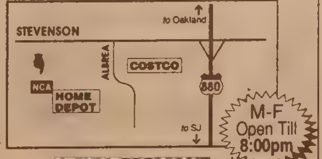

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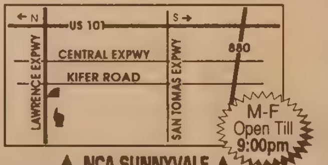

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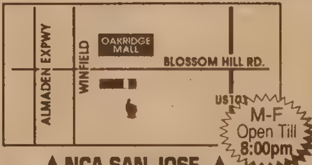

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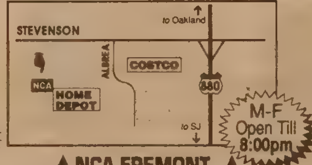

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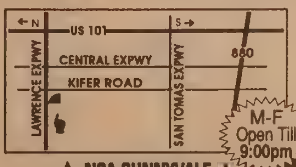

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- 256K Cache Buffer
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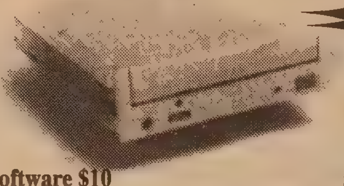

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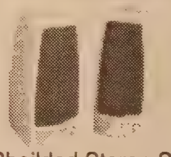

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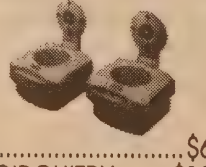

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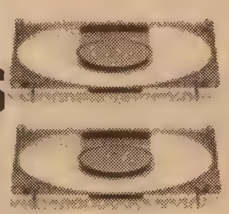

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- 450Kb/Sec. Transfer Rate
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See page 17 for a complete NEC Product Line.

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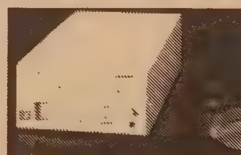

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- **Double Speed** Parallel Port External CD-ROM Drive
- 250ms, 300Kb/Sec., Double Speed, Ideal for Notebooks
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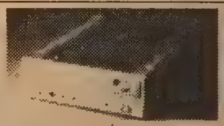
SEE AD ON OTHER PAGE

TEAC CD-50



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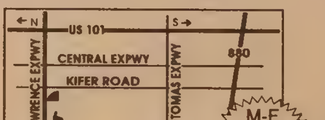

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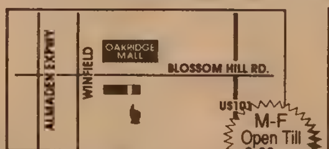

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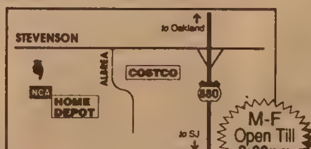

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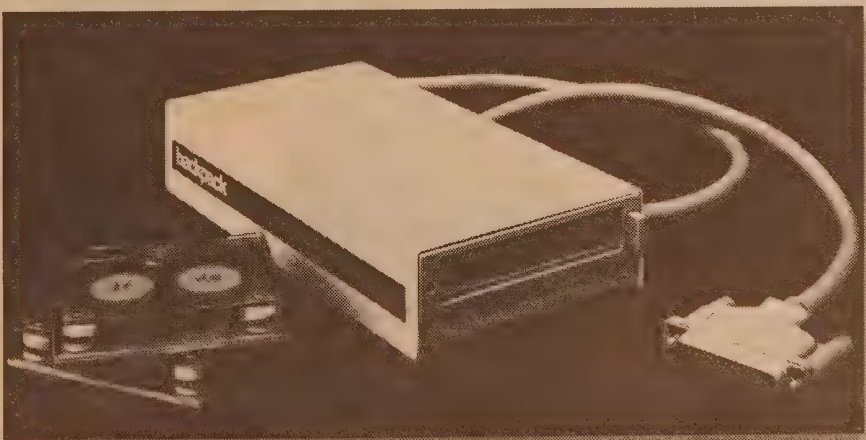

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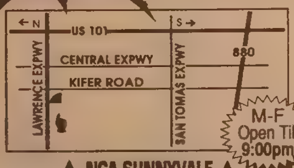
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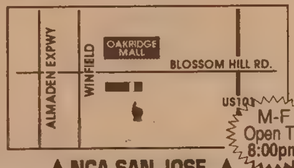
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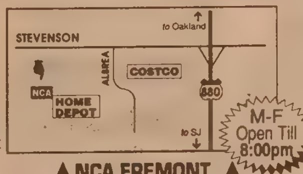
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CD-535

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With SCSI Controller Card, Software & Terminator

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- ▶SCSI Controller Card
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Internal Unit Only.....$319
Includes Caddy & Manual

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- ▶Double Doors
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- ▶Drivers
- ▶Audio Play
- ▶Software
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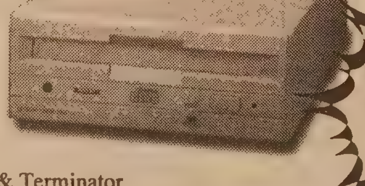

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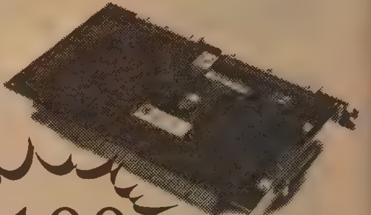

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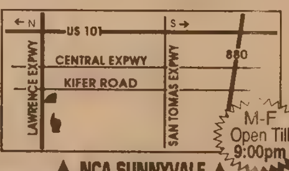

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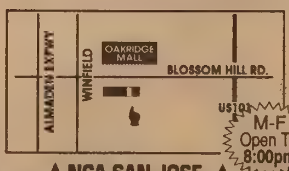

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1542CF	BUS MASTER COMPLETE KIT	$238
1542C+	BUS MASTER KIT WITH COREL SCSI	$314
1640	MICROCHANNEL FOR PS/2, 7HD	$319
2742	EISA KIT, 14HDS	$364
2742W	Fast Wide SCSI EISA	$399
2842VL	Fast SCSI-II VESA	$299
APA-460	Slim SCSI PCMCIA SCSI Card	$289
AHA-2940	PCI SCSI MASTER RISC-BASED I/O	$329
AMM-1570	FULL SCSI WITH ADVANCED AUDIO	$349

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IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
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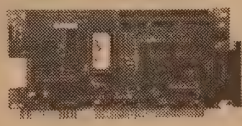
DTC 3280AS	16-Bit ISA to SCSI Host Adapter	$104
DTC3280AS	EISA to SCSI 32-Bit Host w/Cache	$499

American Megatrends



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DESCRIPTION	PRICE
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FastDisk EISA Caching Controller up to 16MB	$389
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FastLAN SCSI	$439

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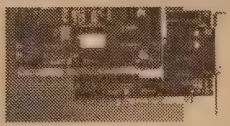

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MODEL	DESCRIPTION	PRICE
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T228	MICROCHANNEL, 7HD	$139
T338	PARALLEL PORT to SCSI ADAPTER	$109
T348	PARALLEL PORT to SCSI PLUS	$149
T358	Parallel Port to SCSI Plus Enhanced	$199

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IN2000	16 BIT 7HD/2FD "Easiest to use"	$175
IN2000PRO	With COREL SCSI	$215
AL1000	SCSI To PARALLEL	$159
AL1000PRO	Above With COREL SCSI	$185

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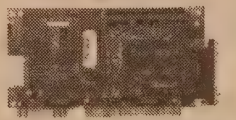

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
TMC850	8-BIT W/BIOS	$59
TMC1670	SVP 16-BIT SCSI VALUE PACK	$149
TMC1680	SVP 16-BIT VALUE PACK 7HD/4FD	$144

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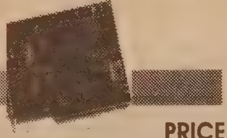

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
20	PCI SCSI Host Adapter, Sup. Wide SCSI-3	$229

BUSLOGIC

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
BT545S	ISA Bus Master Fast SCSI Adapter Kit	$208
BT445S	Bus Master Fast SCSI Kit for VL Bus	$274
BT742A	EISA Bus Master SCSI-II Adapter Kit	$329
BT747S	EISA Bus Master Fast SCSI	$364
BT946C	Bus Master Fast SCSI for PCI Local Bus	$249

UltraStor

SCSI CONTROLLERS

MODEL	DESCRIPTION	PRICE
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24F	EISA, 64K, *Fast* (33MB/SEC)	$359
34F	VESA Local Bus Controller	$269

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IDE CONTROLLERS

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211	2HD/2FD W/2 SERIAL, 1PAR, 1GAME	$23
NCL53	SMART CONT. W/BIOS EASY INSTALL	$49
223	**2HD/2FD for VESA LOCAL BUS I/O**	**$59**
15C	CACHING (UP TO 8MB), 2HD, 2FD **UltraStor**	**$159**

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BT410A	IDE Cache Controller for VLB	$129
BT910A	IDE PCI Cache Controller	$159

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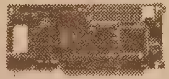

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IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
DC-200	ISA IDE 4HD/2FD, 2.88MB FLOPPY SUPPORT	$89
DC-420VLB	VESA IDE 512K CACHE	$108
DC-4030VL-2	VESA IDE 2.88MB SUPPORT 4HD/2FD	$119
DC-200M	ISA IDE 512K CACHE 4HD/2FD 2.88 SUPPORT	$129

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IDE CONTROLLERS

MODEL	DESCRIPTION	PRICE
DTC 2278AS	VESA Multi I/O 2s/1p/1g	$39
DTC2277VLL	VESA Caching IDE Controller	$149
DTC 2280	16-Bit Super I/O 2FD/2HD 2s/1p/1g	$19.99

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2 IDE DRIVES/2 FLOPPY
2 HIGH SPEED 16550 SERIAL PORTS
1 PARALLEL PORT / 1 GAME

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13-Port Super I/O Card
4 INTEGRATED NS16550 HIGH SPEED UARTs

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- 2 IDE HD
- 4 Floppy
- 2 Parallel
- 4 Serial
- 1 Game

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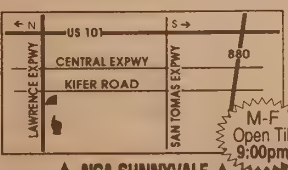

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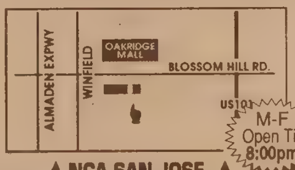

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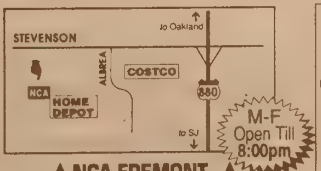

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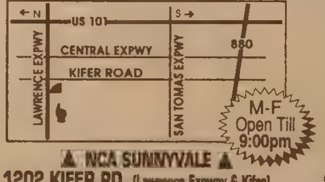

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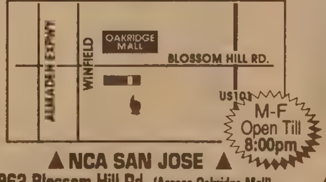

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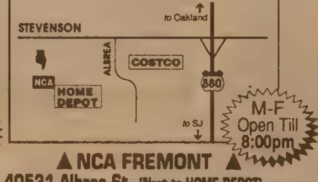

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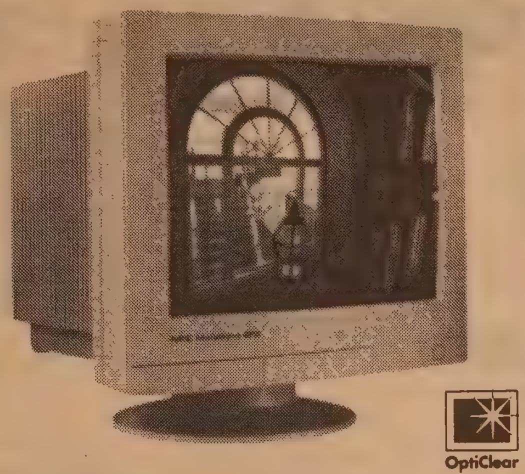

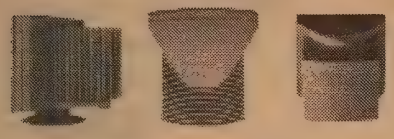

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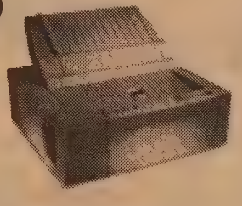

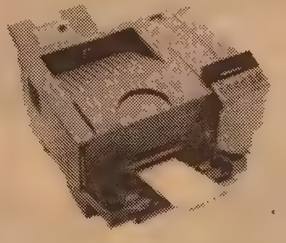

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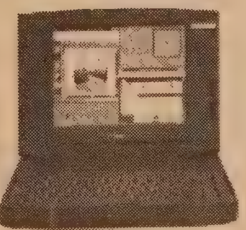

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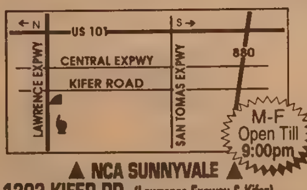

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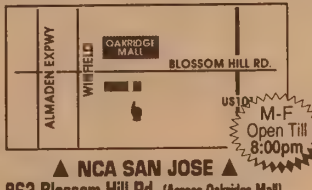

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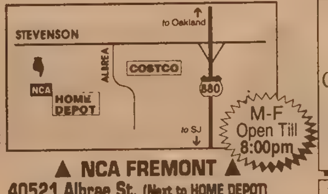

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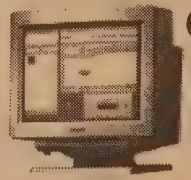

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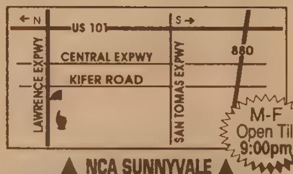

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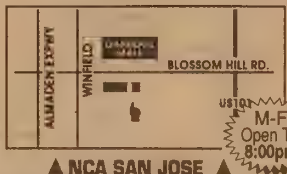

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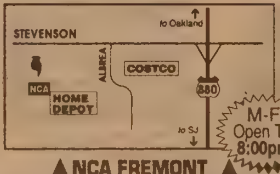

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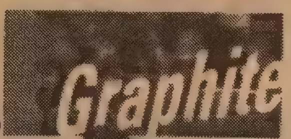

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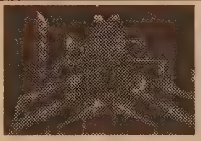

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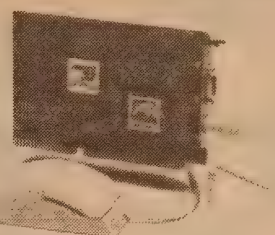

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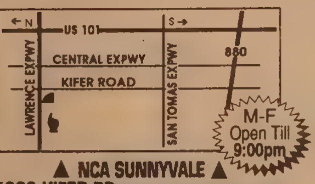

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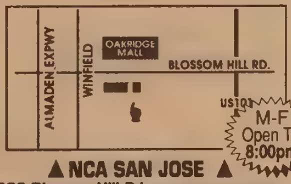

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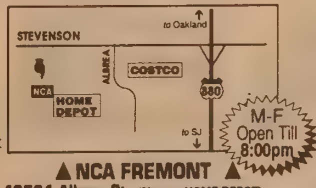

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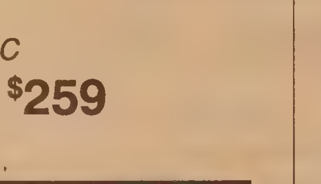
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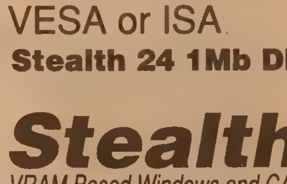
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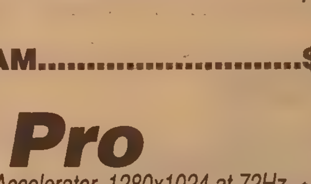
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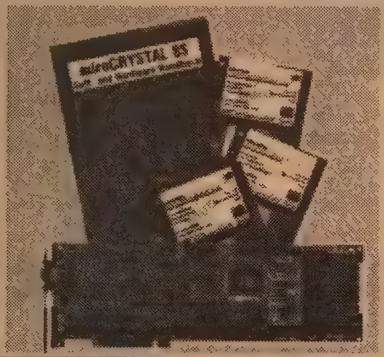

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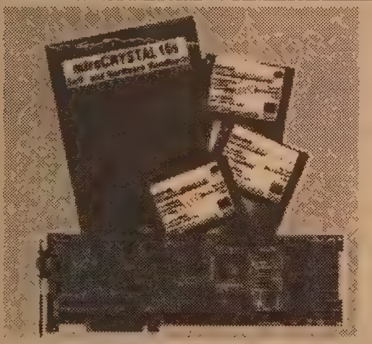

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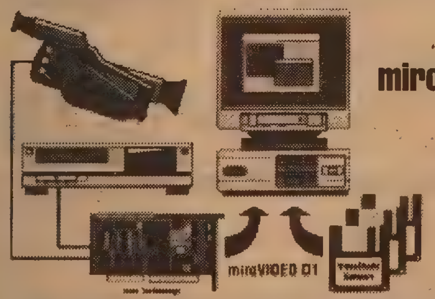
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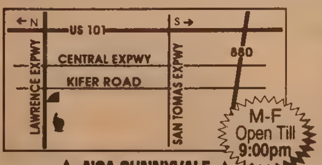
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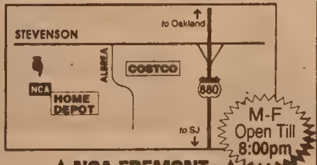
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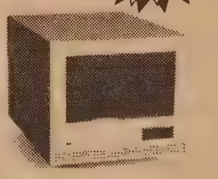

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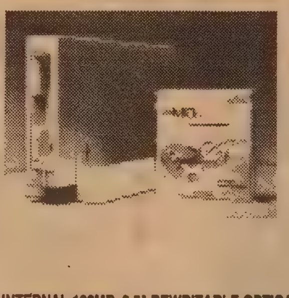

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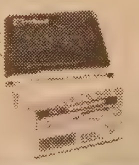

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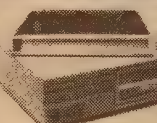

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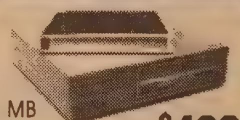

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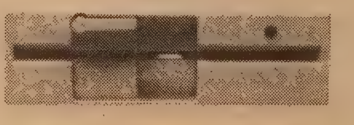

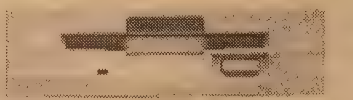

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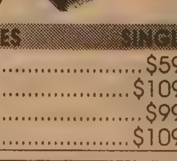

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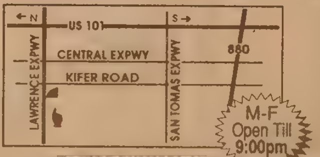

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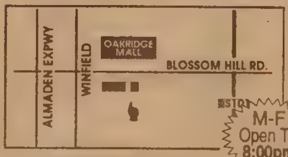

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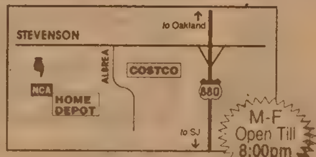

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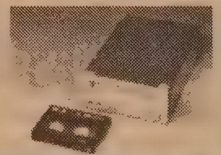

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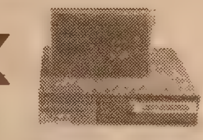

CAPACITY	MODEL	INTERNAL	EXTERNAL
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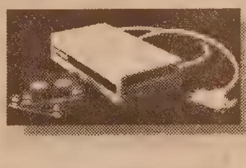

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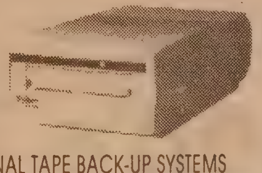

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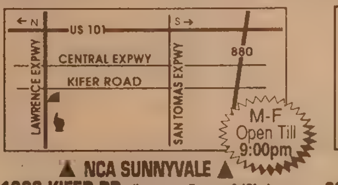

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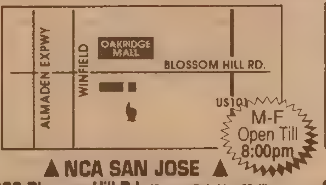

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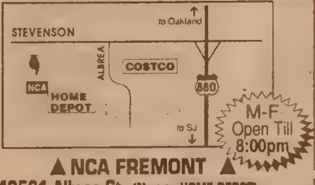

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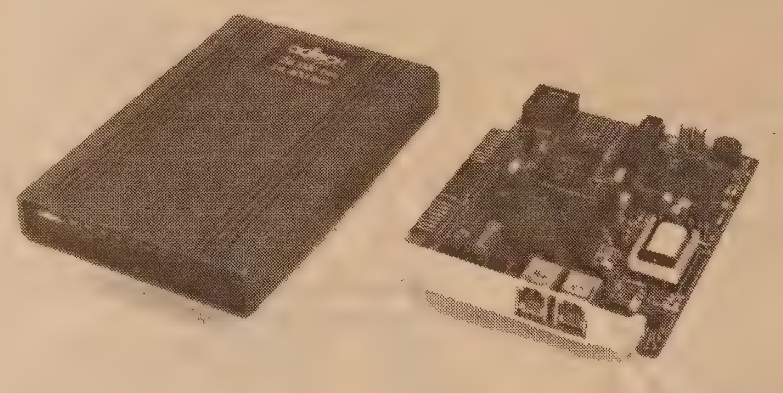

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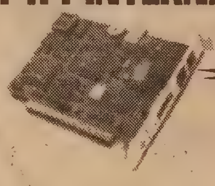

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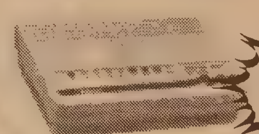

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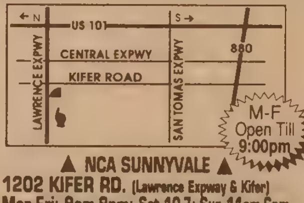

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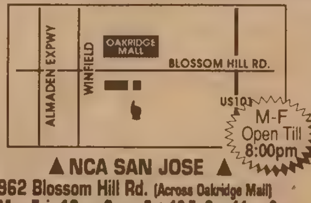

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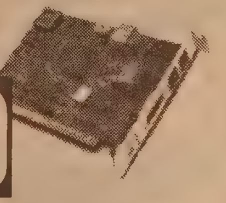

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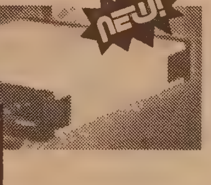

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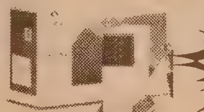

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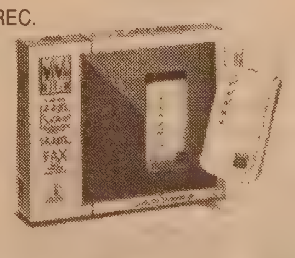

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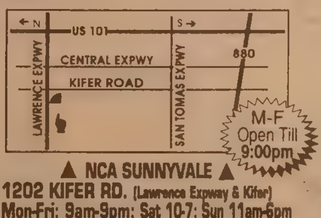

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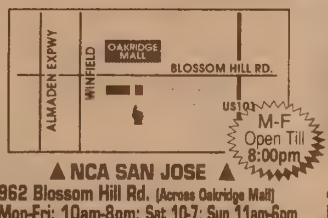

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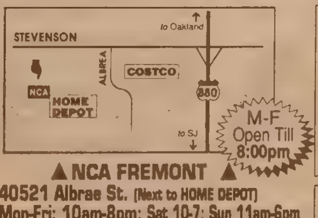

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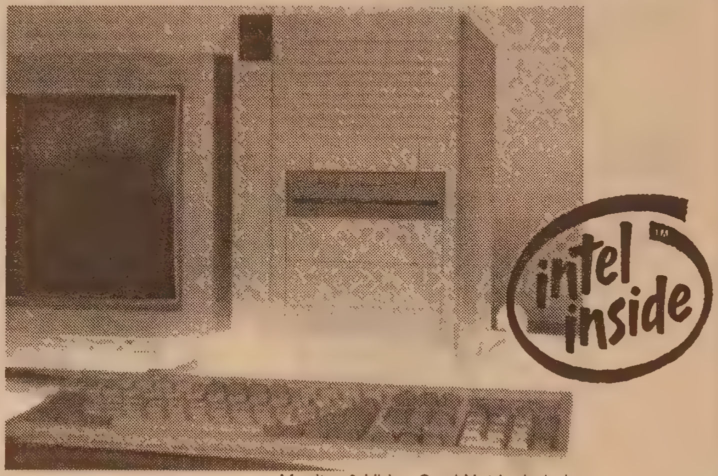

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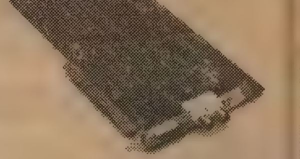

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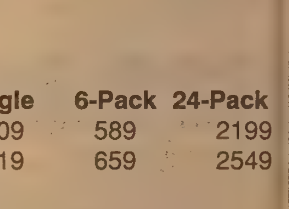

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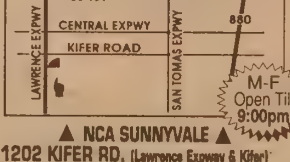

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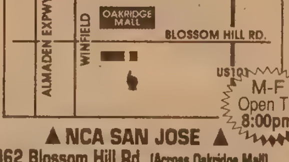

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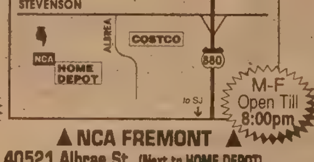

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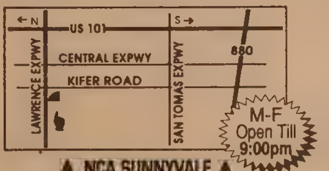

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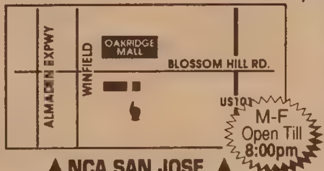

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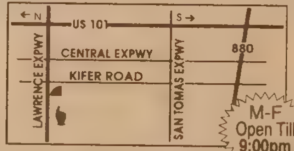
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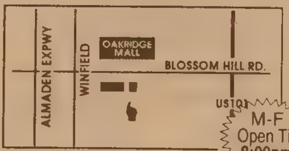
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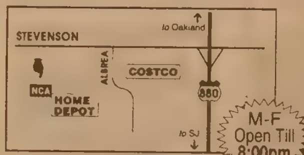
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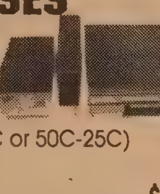

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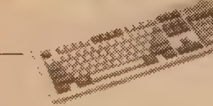

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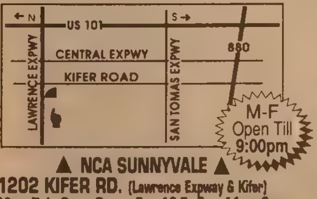

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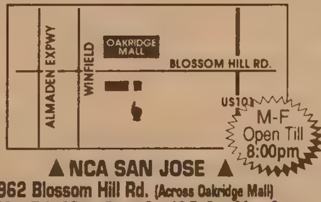

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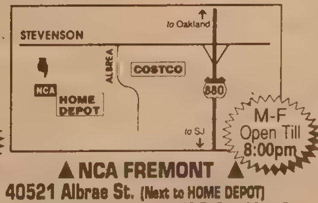

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continued from page 82

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NetCruiser product from Netcom (an Internet access provider) is a good example of how Internet connectivity and applications can be tightly integrated.

NetCruiser runs as a single program that establishes a network connection to one of Netcom's Internet hosts. It provides good graphical interfaces for email, ftp, telnet, WWW, Gopher, ping, and finger, as well as utility support for viewing binary images. The Internet's most popular applications are conveniently at hand, and bundling the applications into a single program vastly improves their ease of use. It doesn't hurt that the relatively ugly business of setting up the connection in the first place is largely out of sight.

The one drawback to tightly integrated packages is simply that they are tightly integrated. NetCruiser is great for making an Internet connection through Netcom. It's not intended to be a general purpose protocol implementation and probably won't do for serial connections to other sites that support SLIP or PPP (your employer's private TCP/IP network, for example).

Tightly integrated packages are an all-or-none sort of affair. They don't easily support alternative or independent versions of the applications they integrate, a fact that makes experimentation more difficult. ■

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continued from page 142

changes, the system loaded in considerably less than a minute. But more importantly, applications worked much faster. No longer was I cursing Windows.

Video

But my upgrading was not done. I needed to examine two more areas. First was the video card. I had been using an ATI Ultra card for a couple of years and wanted to know how to improve the performance. Before changing motherboards, I installed a Graphics Ultra+. This board is terrific. It gives excellent performance and also comes with a mouse. I like this arrangement as it saves an expansion slot.

Although I was pleased with its performance, I wanted to see what a really fast VLB graphics board would do, now that I had VLB capability.

The benchmarks consistently indicate that the fastest video board is the Diamond Viper board. Unfortunately, this board will work only with real Intel 486 processors. It would not work in my system, with the Cyrix CPU. Diamond does, however, make several other fast VLB boards, so I tried their Stealth Pro. It is fast and flexible, but I actually found that, for normal business uses like word processing and spreadsheets, a fast video board does not offer greatly enhanced performance.

In the end, I went back to my ATI board because of the built-in mouse port. I don't do lots of video-intensive work, and couldn't justify the additional expense of a super fast video board. If you're running CAD or other programs that make high demands on your video system, you may want to consider one of the Diamond boards. They are excellent and the company provides wonderful technical support if you have any kind of problem.

Controller Cards

My final experiment was to run a faster controller card from Promise Technology. There was some improvement in performance, but, again, not dramatic enough to justify spending the extra $100. I suspect that I would find much more dramatic improvement if I were to replace my hard drive with a super fast model.

The two most important elements in increasing performance are added system memory and onboard cache.

Upgrade Or Replace?

When you begin to upgrade an older computer, it's easy to get carried away. After all, virtually every part of the computer can be replaced by newer and faster components. But if you want to do this, you're better off buying a new computer—it will be cheaper in the long run. My purpose is simply to indicate ways in which you can get a few more good years out of an older machine that still works well and has a lot of life left.

In the end, I concluded that the two most important elements in increasing performance are added system memory and onboard cache. These changes will make a dramatic improvement in performance. The rest of the changes are real, but not as dramatic, and perhaps too costly to justify an upgrade, unless you have specific applications that can take advantage of the improved performance. ■

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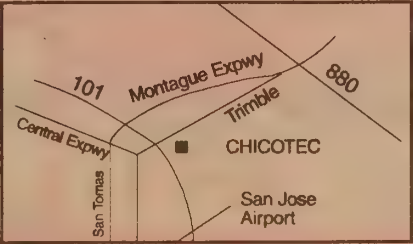

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Things That Make You Go Hmmmm! #1

Although the new i486DX4 is running at 100MHz the Pentium 60MHz is considerably faster. Why? 1) The Pentium is 64-bit architecture as opposed to 32-bit for the i486DX4. 2) The Pentium is a superscalor i.e. executes two (or more) instructions per one cycle as opposed to one for i486DX4. 3) On a 60MHz Pentium based system, both the Processor and board run at 60MHz. On a i486DX4 system on the other hand, the board runs at 33MHz while the Processor runs at 100MHz!

Hmmmm! Hmmmm! Hmmmm! Hmmmm! Hmmmm!

PowerPC is making its move into the mainstream, and many of you are considering buying a PowerPC based system instead of a 486 or Pentium system. Sure, since you're promised to run your DOS and Windows applications on it. But what you might not have known is that until these applications are written *specifically* for the PowerPC, they will run in *EMULATION* mode! Which means they will run as if they were running on a 386SX or slower based system!

Hmmmm! Hmmmm! Hmmmm! Hmmmm! Hmmmm!

The 90MHz (60x1.5) and 100MHz (66x1.5) Pentium Processors differ from the 60/66MHz in more ways than the speed. The newer Pentiums (code named P54C) incorporate new features such as the SL (3.3V vs. 5V) technology for power management and .6 micron BiCOMS technology with 3.3Mil transistors instead of .8 micron and 3.1Mil transistor. The increase in transistors enabled the processor to integrate components that were previously external to the processor (e.g. Multi-processor interrupt controllers) in addition to increasing the speed of communication between these components!

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- OverDrive Socket, 16554 Ports
- DOS 6.2, Windows 3.11 & Mouse

Special Features:

The Revenge incorporates the latest motherboard from Intel Corporation-Premiere Batman, and a Video Card that is designed by the leader in Graphics accelerator Cards-Diamond Computer Systems.

*Benchmarks**

- *WinMarks (million)*....................**84**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*..............................**2699**
  - *FPU*..............................**1069**
- *iCOMP*..................................**510**
- *SPECint/fp92*....................**63/55**

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EISA/PCI/ISA Bus
Matrox Ultima MGA Video

MICRONICS M5PE **$4795**

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- 1.44MB Floppy Drive
- ViewSonic 17G Flat .28dp NI Monitor
- PCI Matrox MGA 64-bit 2MB VRAM
- PCI Fast SCSI-2 Controller
- GT-300 Full Tower Case 300W w/Door
- Focus 2001 Click Keyboard
- 3-PCI, 4-EISA and 1-PCI/EISA slots
- Pentium OverDrive ZIF Socket
- 16550 UART Serial Ports
- DOS 6.2, Windows 3.11 & Mouse

Special Features:

The Evolution delivers the ultimate in bus architecture by combining the PCI and EISA buses. It is ideal for 32-bit operating systems where addressing virtual memory above 16MB/ISA boundaries is an essential issue!

*Benchmarks**

- *WinMarks (million)*....................**92**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*..............................**2894**
  - *FPU*..............................**1188**
- *iCOMP*..................................**567**
- *SPECint/fp92*....................**70/63**

Intel Pentium 90 and 100MHz Processors

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Pentium 90MHz Processor
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ATi Mach64 Video

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Special Features:

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*Benchmarks**

- *WinMarks (million)*..................**123**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*..............................**3493**
  - *FPU*..............................**1604**
- *iCOMP*..................................**735**
- *SPECint/fp92*....................**90/72**

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Pentium 100MHz Processor
Intel Boomerang Motherboard
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- GT-300 Full tower case 300W w/Door
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Special Features:

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*Benchmarks**

- *WinMarks (million)*..................**123**
- *LandMark v.3.1 (ps/sec)*
  - *CPU*..............................**3988**
  - *FPU*..............................**1782**
- *iCOMP*..................................**815**
- *SPECint/fp92*..................**100/80**

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- 32-bit PCI local Bus Video adapter 2MB VRAM Upgradeable to 4MB 1280x1024 16.7M colors
- Deluxe Baby AT (Full-Tower) Case 250W
- 101 Enhanced Keyboard
- 2-PCI and 3-ISA slots
- Integrated 2S and 1P Ports
- 32-bit PCI Integrated Ethernet adapter
- Microsoft Windows NT with License
- Designed and Manufactured in the U.S.A.
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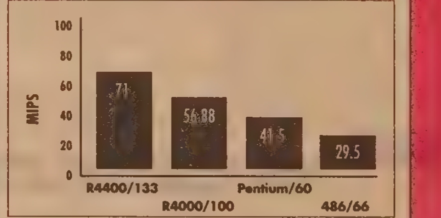
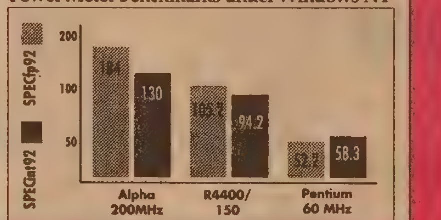
MIPS R4400/150 vs. Pentium/60



Power Meter benchmarks under Windows NT



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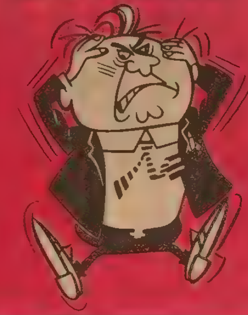
- Should I buy ISA, EISA, VESA or PCI?
- Should I buy from local, name-brand or mail-(dis)order?
- Do mail order companies help me in future upgrades?
- Why should I wait 4–6 weeks to get my system?
- How come some ads look too good to be true?
- How can I tell I will receive what I ordered?

BEFORE



AFTER

Mr. Wise bought a NOW Computer!

- I paid the right price for the right system
- I was treated as a customer, not a number
- System received on the day I was promised
- Configuration was exactly as I specified
- Warranty and Support were outstanding
- I can count on NOW for future upgrade and help
- I recommend NOW to all my friends

COMMANDER

"Just the right configuration" for "Just the right price" system! Ideal for those who seek a fast, reliable and upgradeable system and are on a tight budget.

i486DX2/66MHz Processor
VESA/ISA Green Motherboard
Diamond Stealth 24 Video

- 66MHz Intel i486DX2 Processor 8K
- ASUS or AIR Green VESA Motherboard
- 8MB 70ns RAM, 256K WB cache
- Western Digital 340MB IDE 12ms HD
- 1.2 and 1.44MB Floppy Drives
- 15" ADI MicroScan 4G Monitor
- Diamond Stealth 24 VLB Video Card
- Promise Tech. IDE VLB Controller
- Medium-tower Case 230W
- 101 Enhanced Keyboard
- 2-VESA (3 on AIR) and 5-ISA slots
- Pentium OverDrive P24T/CT Socket
- DOS 6.2, Windows 3.11 & Mouse

$1995

BEST BUY GEMINI 17

The Gemini 17 satisfies two of the most desired features in a new PC nowadays; 17" Monitor and PCI Local Bus, while maintaining a very low price that is hard to resist.

ASUS PCI/ISA Motherboard
17" ADI .26dp Flat Monitor
PCI Fast SCSI-2 interface

- 66MHz Intel i486DX2 Processor 8K
- ASUS ISA/PCI Motherboard
- 256K write-back cache up to 512K
- 8MB 72-pin 70ns RAM up to 128MB
- Quantum 340MB SCSI-2 Hard Drive
- 1.44MB Floppy Drive
- 17" ADI MicroScan 5A .26dp Flat Monitor
- PCI Stealth32 Video Card 1MB
- PCI Fast SCSI-2 Controller
- Medium-Tower Case 230W PS
- Focus 2001 Click Keyboard
- 3-PCI, 5-ISA Expansion slots
- Pentium OverDrive P24T/CT Socket
- DOS 6.2, Windows 3.11 and Mouse

$2395

PHANTOM

Another breakthrough from NOW... The Phantom. Built for those who strive for higher performance over the i486DX2/66MHz processor and not yet ready to spend the money for a Pentium.

i486DX4/100MHz Processor
MICRONICS JX30Gc Motherboard
ATi Ultra Pro Video

- 100MHz Intel i486DX4 Processor 16K
- Micronics JX30Gc Green Motherboard
- 8MB 70ns RAM, 256K WB cache
- Western Digital 340MB IDE 12ms HD
- 1.44MB Floppy Drive
- 15" ViewSonic 15 Flat Green Monitor
- ATi Ultra Pro VLB 2MB VRAM
- Built-in mode 3 IDE VLB Controller
- Medium-tower Case 230W
- 101 KeyTronic Keyboard
- 2-VESA and 5-ISA slots
- Pentium OverDrive P24T/CT Socket
- DOS 6.2, Windows 3.11 & Mouse

$2695

FUNN TYME

Funn Tyme brings your entire family endless hours of entertainment, education and lots of FUN. Get your family the system they've been dreaming of... besides, it's about time you have some *Funn Tyme* with your kids!

- 66MHz Intel i486DX2 Processor 8K
- ASUS Green VESA Motherboard
- 8MB 70ns RAM, 256K Fast cache
- 340MB IDE 12ms Hard Drive
- 1.2 and 1.44MB Floppy Drives
- 15" ADI MicroScan 4G Monitor
- Genoa 8500VL 1MB Video Card
- Promise Tech VLB IDE Controller
- Medium Tower Case 230W
- 101 Enhanced Keyboard
- DOS 6.2, Windows 3.11 & Mouse
- Toshiba 3401B 2X 200ms CD-ROM
- Sound Blaster 16 w/SCSI-2 Port
- Labtec 550 Amplified Speakers

TEN BEST CD TITLES:

- PC Karaoke
- Time-Man of the year
- Best of Media Clips
- CD-ROM of CD-ROMs
- King's Quest
- World Atlas
- World fact Book
- Stellar 7
- PC Animation Festival
- Doom

$2495

ECONOMY PC

Our Economy PC line is designed for those who need a low level entry system with room for future expansion. Priced at rock bottom prices, below competition, while preserving the high-quality and superior service of NOW!

- Intel i486SX/DX/DX2 Processor
- VESA Local bus Motherboard
- 4MB 70ns RAM, 256K cache
- 170MB IDE 12ms Hard Drive
- 1.2 or 1.44MB Floppy Drive
- 14" SVGA .28dp Non-Int. Monitor
- VESA SVGA accelerator 1MB Video Card
- VESA IDE Controller with Ports
- Mini-tower or Desktop Case 200W
- 101 Enhanced Keyboard
- Pentium OverDrive ZIF Socket

i486SX/33MHz	$999
i486DX/33MHz	$1175
i486DX2/66MHz	$1325
i486DX4/100MHz	$1650

ULTIMEDIA UPGRADE KITS

IT #1 STARTER KIT $269
Panasonic 562 dbl spd/320ms
Sound Blaster Pro Deluxe
Two stereo speakers

KIT #2 PROFESSIONAL KIT $569
- Toshiba 3401B/dbl spd/200ms
- Pro Audio Studio 16
- Labtec 550 amplified speakers

KIT #3 ULTIMATE KIT $669
- NEC 3Xi triple speed 195ms
- Sound Blaster 16 SCSI-2 port
- Altec ACS-50 speakers

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One year parts and lifetime labor. No surcharge for credit cards, most major credit cards accepted. Prices do not include shipping. 15% restocking charges after 30 days. No returns for items missing disks, manuals or packaging. Allow 14 days for a refund. All registered trademarks are trademarks of their respective companies. Not responsible for typographical errors. Prices and specs are subject to change without notice or obligation.

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NOW GUARANTEES YOUR SATISFACTION!

NOW employees are *your* employees. We are dedicated to satisfying our customers, and we are willing to do whatever it takes. NOW offers lifetime technical support (with optional 24 hour toll-free), a post-sale upgrade option, an on-site service option, and a 30 day money back guarantee. NOW is a member of the Better Business Bureau for those interested in checking our service and support history.

NOW CONFIGURES A SYSTEM THAT BEST FITS YOUR NEEDS

At NOW, we view our computer systems as tools – tools that are used to accomplish certain tasks. If the tool is not designed correctly, then the tasks won't be accomplished efficiently. With this in mind, our goal is to build you a system that fits your specific requirements. Don't be fooled by "dirt cheap" or "lowest price" advertisements – call our sales staff and consult with them on a system configuration that fits *your* needs.

NOW IS THE CORPORATE CHOICE

For years, NOW has been supplying the corporate world with state-of-the-art computers and services. Our corporate customers are our business partners – we understand their needs and we go to extremes to satisfy those needs in the most efficient and productive manner possible. Our corporate customers enjoy NOW's outstanding service and support program – a program that is unparalleled in the industry. Our corporate services include (but are not limited to) on-site service, free pick-up & delivery; 24 hour turn-around time for system repairs, temporary loaners for items that are being repaired, and a dedicated sales representative. If you represent a corporation (small, medium or large), give NOW the opportunity to become your system supplier – we won't let you down.

NOW IS A TECHNOLOGY LEADER

For many people, NOW is the source for information about the latest cutting-edge technology. When it comes to being an industry leader, NOW is always ahead of the competition. If you are always on the lookout for the latest technology, read our ads – we keep you ahead of the crowd.

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FAX: 415/345-4576
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FAX: 408/894-7062
2526 Seaboard Avenue
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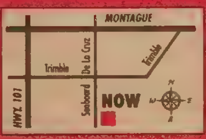

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FAX: 510/803-9790
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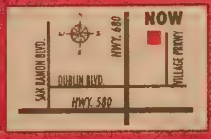
Dublin, CA 94568
Hours: M-F 9-6 / Sat. 11-5



Product Spotlight

UPDATES

- **AimTech** released **IconAuthor 5.1 for OS/2** software that lets users create interactive applications including computer-based training programs, performance support systems, and self-service kiosks. AimTech Corp., 20 Trafalgar Sq., Suite 300, Nashua, NH 03063. (603)883-0220.
- **Attain** released **In Control 3.0**, its Macintosh-based planner and organizer software. Version 2.0 users can upgrade for $34.95. Attain Corp., 48 Grove St., Somerville, MA 02144. 1-800-925-5615.
- **DayStar Digital** announced special pricing on its **Turbo 040** bundled with a 128K cache, saving users $100 off the cost of purchasing the two products separately. DayStar Digital, Inc., 5556 Atlanta Highway, Flowery Branch, GA 30542. (404)967-2077.
- **DeltaPoint** released **DeltaGraph Pro 3 for Power Macintosh** computers. The product upgrade, v3.1, is optimized for Apple Computer's new generation of Macintosh computers. DeltaPoint, Inc., 2 Harris Ct., Suite B-1, Monterey, CA 93940. (408)648-4000.
- **Disk Software** announced **TG-CAD Professional v5.0**, for Windows and DOS, an upgrade to its CAD/CAM/CAI developer's kit. Disk Software, Inc., 109 S. Murphy Rd., Plano, TX 75094. 1-800-635-7760.
- **FuzziWare** announced the July release of **FuziCalc v1.5**, its fuzzy number modeling tool. Registered users of any previous FuziCalc version may upgrade for $39.95. FuzziWare, Inc., PO Box 11287, Knoxville, TN 37939. 1-800-472-6183.
- **MapInfo Corp.** released **MapInfo 3.0**. MapInfo Corp., One Global View, Troy, NY 12180. (518)285-6000.
- **Mustang Software** introduced **Qmodem for Windows 1.1** communications software, adding improved fax capabilities. Current users can download a free upgrade by dialing MSI's headquarters BBS at (805)873-2400, or from MSI's Support Forum on CompuServe, GEnie, and AOL. A new set of disks can be purchased for $23. Mustang Software, Inc., 6200 Lake Ming Rd., Bakersfield, CA 93306. (805)873-2500.
- **ParcPlace** introduced **ObjectBuilder 2.5**. The new release allows C++ developers to encapsulate off-the-shelf, non-ObjectBuilder-based Xt building blocks and use them to construct a user interface for C++ based applications. ParcPlace Systems, Inc., 999 E. Arques Ave., Sunnyvale, CA 94086. 1-800-759-7272.
- **SoftArc** released **FirstClass 2.5**, its cross-platform communications software offering extra mail functionality and connectivity to databases. SoftArc, Inc., 1902 Ridge Rd, #325, W. Seneca, NY 14224. (416)299-4723. Email: sales@softarc.com .
- **Symantec** announced **ACT! for Windows 2.0**, the latest version of its contact management software. Version 2 now includes complete network support, integrated email support, and enhanced calendar and address book printing. Current users can upgrade for $69.95. Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014. 1-800-441-7234.

New Products

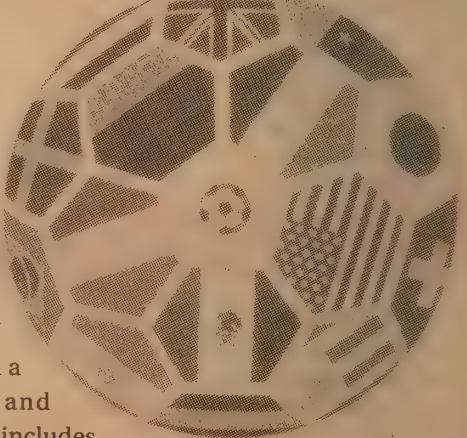
Notebooks

M.O.S. Legacy Notebook

Early this year, Mobile Office Systems launched a fully modular and upgradable notebook. The Legacy Notebook has removable components including the CPU, hard drive, trackball, keyboard, and RAM card. Every component is upgradable to protect from obsoleteness, and there will soon be a Pentium upgrade available. The LCD display is also interchangeable between mono and color (TFT or STN Dual Scan). M.O.S. also offers a wide range of optional function modules for the Legacy, like a PCMCIA, scanner, LAN, SCSI adapter, fax/modems, a second serial port, multimedia, and a data security box. (List price for the Legacy 486DX2-66 is $1699) Mobile Office Systems, 1574-3 N. Batavia St., Orange, CA 92667. (714)974-5134.

Wedge ShowBook 4E

Offering power and flexibility, the Wedge ShowBook 4E notebook supports an array of CPUs, including the latest 100MHz DX4. Other features include a 32-bit Local Bus with 1MB video RAM, PowerBook-style trackball with palm rest, removable hard drive, two battery compartments which allow you to "hot swap" the battery units without turning the notebook off, a built-in Sound Blaster compatible Audio System with microphone and speaker, and PCMCIA Type IV slot. The ShowBook 4E is available in a Monochrome, Dual Scan Color, and Active Matrix Color version. ($3740 includes 250MB hard drive, 4MB of RAM, 1MB memory for video, 1.44MB floppy drive, and active matrix color display) Wedge Technology, Inc., 1657 McCandless Dr., Milpitas, CA 95035. (408)263-9888.



Accessory

World Soccer Ball Mouse Pad

In honor of the World Cup games being held in the US this year, Computer Expressions has come out with the World Soccer Ball mouse pad. The round

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DOUBLE SPEED MULTIMEDIA KIT

- Panasonic 562B CD-ROM
- Sound Blaster Sound Card
- Stereo Amplified Speakers
- Cable & Software Driver
- 5 Bundled CD Titles Encyclopedia Etc.

$299

TRIPLE SPEED MULTIMEDIA KIT

- NEC 3XI CD-ROM
- Media Vision Spectrum 16
- Stereo Amplified Speakers
- Cable & Software Driver
- 5 Bundled CD Titles Encyclopedia Etc.

$519

SYSTEM	MB+CPU We Offer You More Cache Than Our Competitors	Basic System (See Below)	Basic System 120MB HDD SVGA Card SVGA Monitor (170MB + $35)	Basic System 170MB HDD SVGA Card SVGA Monitor 4MB RAM (250MB + $45)	Basic System 250MB HDD SVGA Card SVGA Monitor 4MB RAM 1.44 & 1.2 F/D (340MB + $40)	Basic System 420MB HDD SVGA Card SVGA Monitor 4MB RAM 1.44 & 1.2 F/D (540MB + $100)
PENTIUM P5-66/256K CACHE VLB	$999	$1247	$1407	$1849	$1907	$1977
PENTIUM P5-60/256K CACHE VLB	$849	$1047	$1207	$1607	$1707	$1807
486DX2-66/256K CACHE VLB	399	567	927	1067	1147	1187
486DX-50/256K CACHE VLB	407	557	927	1077	1167	1207
486DX2-50/256K CACHE VLB	327	487	847	997	1087	1137
486DX-40/256K CACHE VLB	289	457	817	967	1057	1107
486DX-33/256K CACHE VLB	276	427	787	937	1017	1067
486SX-33/256K CACHE VLB	179	337	699	847	937	987
486SLC2-66/64K CACHE VLB	225	379	737	887	977	1027
486SLC2-66 ISA	157	317	697	827	917	967
486DLC-40/128K CACHE ISA	139	297	657	807	897	947
486DLC-33/128K CACHE ISA	125	287	647	727	897	937
386DX-40/128K CACHE ISA	85	247	607	757	847	897
386SX-40 ISA	65	227	587	737	827	877

Systems Assembled & Quality Assurance in USA

BASIC SYSTEM **Motherboard & CPU, 1 MB Memory, Cache Memory, Deluxe Mini-Tower Case w/Power Supply, 101 Enhanced Keyboard, 1.44 MB Floppy, IDE/IO Controller w/2HD/2FD/2S/1P/1G Ports**

POPULAR CD TITLES

EDUCATION	
Compton's Interactive Encyclopedia	$49
Dinosaurs Encyclopedia	15
Mayo's Clinic Family Health Book	16
Microsoft Bookshelf	29
Microsoft Word	29
Mother Goose	14
Multimedia Audobons Birds/Mammals	14
Macmillan Dictionary	17
National Geographic Mammals	18
Playing With Language English/Spanish	19
National Parks	15
GAMES	
Arthur's Teacher Trouble	$19
Beauty & The Beast/Sleeping Beauty	14
The 7th Guest	25
Return To Zork	17
Carmen San Diego	17
Kings Quest V	14
Stellar 7	15
Strike Eagle F15	19
Chess Master	15
Jones In Fast Lane	14
Star Wars Chess MPC	19
Who Killed Sam Ruppert	16
Willy Beamish	15
ADULT	
Sakura	$13
Hot Shareware	13
LA Traviata	13
Hot Cars & Girls	13
Original Hot Night	13

A LOT MORE BUNDLED TITLES COMING IN

FLOPPY & HARD DRIVES

Teac 1.44MB	$35
Teac 1.2 MB	44
Teac Combo 1.2/1.44 MB	96
120 MB IDE	149
170 MB IDE	169
210 MB IDE	185
250 MB IDE	199
340 MB IDE	237
420 MB IDE	255
540 MB IDE	345

MONITORS

14" SVGA 1024 .39 Int	$183
14" SVGA 1024 .28 Int	205
14" SVGA 1024 .28 NI	225
IMPRESSION: 14" INT/NI	$218/235
CTX:	
14" SVGA 1024 .28 Int/NI	$227/241
15" CMS1561 1024 NI/1561CR	316/326
17" CPS1760 1280 NI/1760CR	629/637
VIEWSONIC:	
6E (14")/15 (15")	$273/429
NEC, SONY	**LOWEST**

VIDEO CARDS

SVGA 512K/1MB	$35/49
Windows Accel 1 MB	54
Trident VL 1 MB	67
Cirrus Logic VL 1 MB	67
Spider VL 1 MB/PLUS	94/99
Genoa VL 1 MB/PHANTOM 2MB	87/179
Diamond Stealth 1 MB	137
Diamond Viper 2 MB	349
Orchid Fahrenheit 1 MB	134

FAX/MODEM

96/24 S/R Fax/Modem	$37
144/144 Fas Modem Int) Rockwell	85
144/144 Fax/Modem (Int) AT&T	89
144/144 Fax/Modem (Ext)	129
U.S. Robotics 14400 Fax/Modem	109
192/192 Fax/Modem (Int)	129

MULTIMEDIA

Mitsumi CD ROM Double Speed	$135
Panasonic CD ROM-562B Double Speed	139
Toshiba CD ROM Double Speed	289
NEC CD ROM 3xi	339
Sound Card	47
Sound Blaster Pro Deluxe	75
Sound Blaster 16	94
MediaVision Pro Audio Spectrum 16"	99
MediaVision Pro Audio Studio	139
Stereo Speakers 1.5W/14W/44W/80W/120W	8/25/49/59/79

PROCESSORS/MEMORY

486DX CPU	LOWEST
486DLC CPU	LOWEST
SIMM 1 MB/4MB 30/72 Pin	LOWEST
SIMM 4 MB	LOWEST
387DX/40/33/25	29
387SX/33/25	29
Cache RAM	LOWEST

CALL FOR ITEMS NOT LISTED

KEYBOARDS/MICE

Mitsumi 101 Enhanced	$14
Smart 101 Enhanced	17
Keytronics 101 Enhanced	24
Focus 2001 (Click)	30
Focus 9000 Programmable	48
MS Compatible Mouse	8
Logitech Mouse	29
Microsoft Mouse	24

CASES

Mini Tower w/200W PS	$38
Desktop w/200W PS	45
Mid Tower w/230W PS	57
Full Tower w/230W PS	77
Power Supply	27

MISCELLANEOUS

IDE w/2S/1P/1G	$11
IDE VL w/2S/1P/1G (2HD/2FD)	21
IDE VL w/2S/1P/1G (4HD/2FD)	35
IDE & 16550 High Speed I/O	37
Tape Back-Up 250 MB	137
CPU Cooling Fan	8

NETWORK

16 Bit Ethernet Card	$39
Cable	LOWEST
Netware 3.12 5/10/25	575/1350/1999
Netware 4.01 5/10/25	790/1799/2300
Netware Start Kit (Card, Cable & Software)	195

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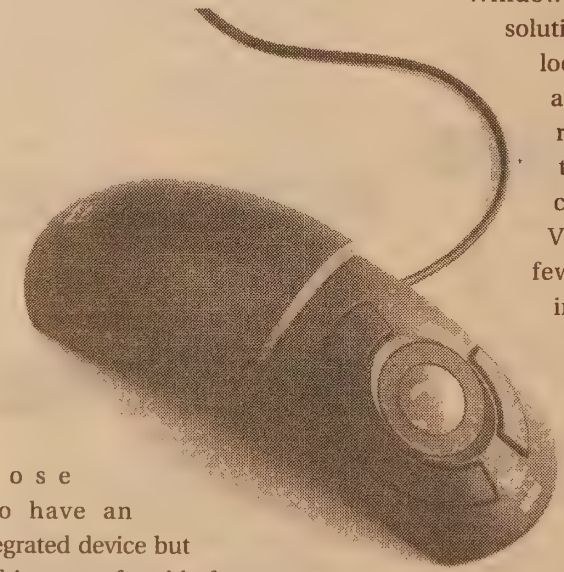
MIRALAMA
ARONES
E. DUANE
101
N
Entrance
STOP
76 GAS STATION
LAWRENCE EXPY
OAK MEAD
(Follow the path past stop sign)
SAN JOSE

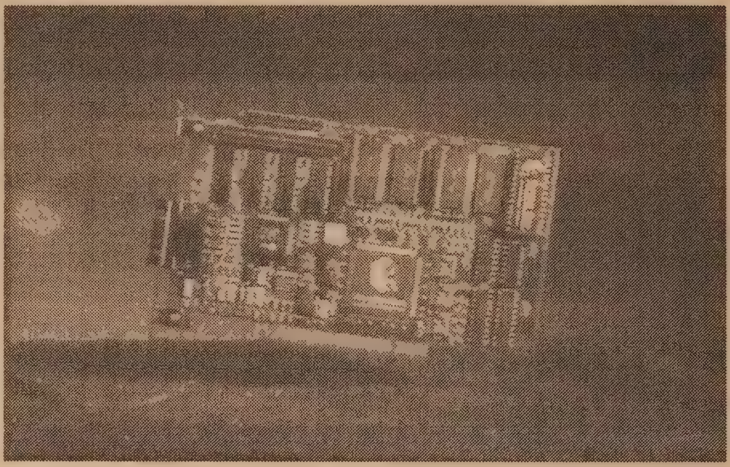
pad looks like a soccer ball, with pentagon- and hexagon-shaped pieces depicting the flags of fifteen of the World Cup contenders, including Mexico, Italy, Germany, Ireland, Cameroon, Spain, and the United States. The pad even has realistic stitching lines. The fifty-two World Cup games are being held in nine American cities for the first time ever this summer, and this is the first time the US has qualified to compete in forty years. Computer Expressions also makes mouse pads with M.C. Escher, the Grateful Dead, and *Gone With the Wind* designs, among others. ($4.50, minimum order of thirty-six) Computer Expressions, Inc., 4200 Mitchell St., Philadelphia, PA 19128-3593. (215)487-7700.

Laptop Peripherals

Logitech TrackMan Voyager



TrackMan Voyager is a highly versatile trackball for portable computers. It is ideal for users who do not have a pointing device included with their laptop, as well as for those who have an integrated device but find it uncomfortable for long work sessions. Voyager's small form factor and integrated protective cover make it easy to carry with you, while its ergonomic design makes it comfortable for the hand over long periods. To make setup and use easier, it can be used without an attaching device securing it to your system. Logitech also provides the latest version of its Enhanced MouseWare software, v6.4, which has been optimized for use with this product. The software allows portable trackball users to easily adjust the cursor speed and directional orientation of the trackball and to set Voyager's three buttons to individualized functions. ($89.95) Logitech, Inc., 6505 Kaiser Dr., Fremont, CA 94555. (510)795-8500.



The Number Nine GXE64 graphics accelerator

PC Hardware

Number Nine GXE64

The Number Nine GXE64 combines a powerful 64-bit local bus DRAM graphics accelerator and the easy-to-use HawkEye for Windows utilities to provide a powerful solution for mainstream Windows users looking for super-fast graphics with an easy way to fine-tune the colors, resolution, and refresh rates of their displays. The upgradable card is available in PCI and VESA VL-bus. This card is installed in a few easy steps: plug in the board, insert a diskette, and run a single setup file to automatically install the optimized software drivers. Number Nine offers a 24-hour bulletin board service that contains driver updates, useful graphics programs and files, technical support, conference messaging, and late-breaking product line and industry news. ($249) Number Nine Computer Corp., 18 Hartwell Ave., Lexington, MA 02173. (617)674-2919.

Canon Innova Vision

The new Canon Innova Vision L50/340 and L33/210 are designed to support multimedia applications. They include a large hard drive (340MB and 210MB, respectively), dual speed CD-ROM drives, Sound Blaster 16-bit stereo cards, and an extensive software set. Standard configurations also include 4MB of RAM, upgradable to 36MB, a graphics accelerator, VESA local bus architecture, and 1MB of video RAM, upgradable to 2MB. They also include a fax modem, shielded stereo speakers, and an SVGA 14" monitor. Canon provides a host of pre-loaded software which includes MD-DOS 6.2, Windows 3.11, MicroFax communications software, Microsoft Multimedia Works, an electronic encyclopedia, and more. (Prices range from $1700 to $2050) Canon Computer Systems, Inc., 2995 Redhill Ave., Costa Mesa, CA 92626. 1-800-848-4123.

Canon Innova Vision L33/210

PCM Alpine Towers

PCM Technologies has introduced a new line of multiple CD-ROM towers that provide up to 4.2GB of storage and allow multiple/simultaneous access to information on industry-standard CDs. The Alpine Towers, which can be used in Macintosh, DOS, or network environments, accommodate from four to sixteen Toshiba CD-ROM drives and feature a universal 110/220V autoswitching power supply, drive activity and power-on LEDs, and software volume control. Multiple towers can be attached to computer networks for virtually unlimited storage capacity. For high-security environments, towers are available with built-in NetWare security features to limit access to specific CD-ROMs. ($1795 for four-drive system without software) PCM Technologies, 4165 E. La Palma Ave., Anaheim, CA 92807. 1-800-232-1347 or (714)961-7000.

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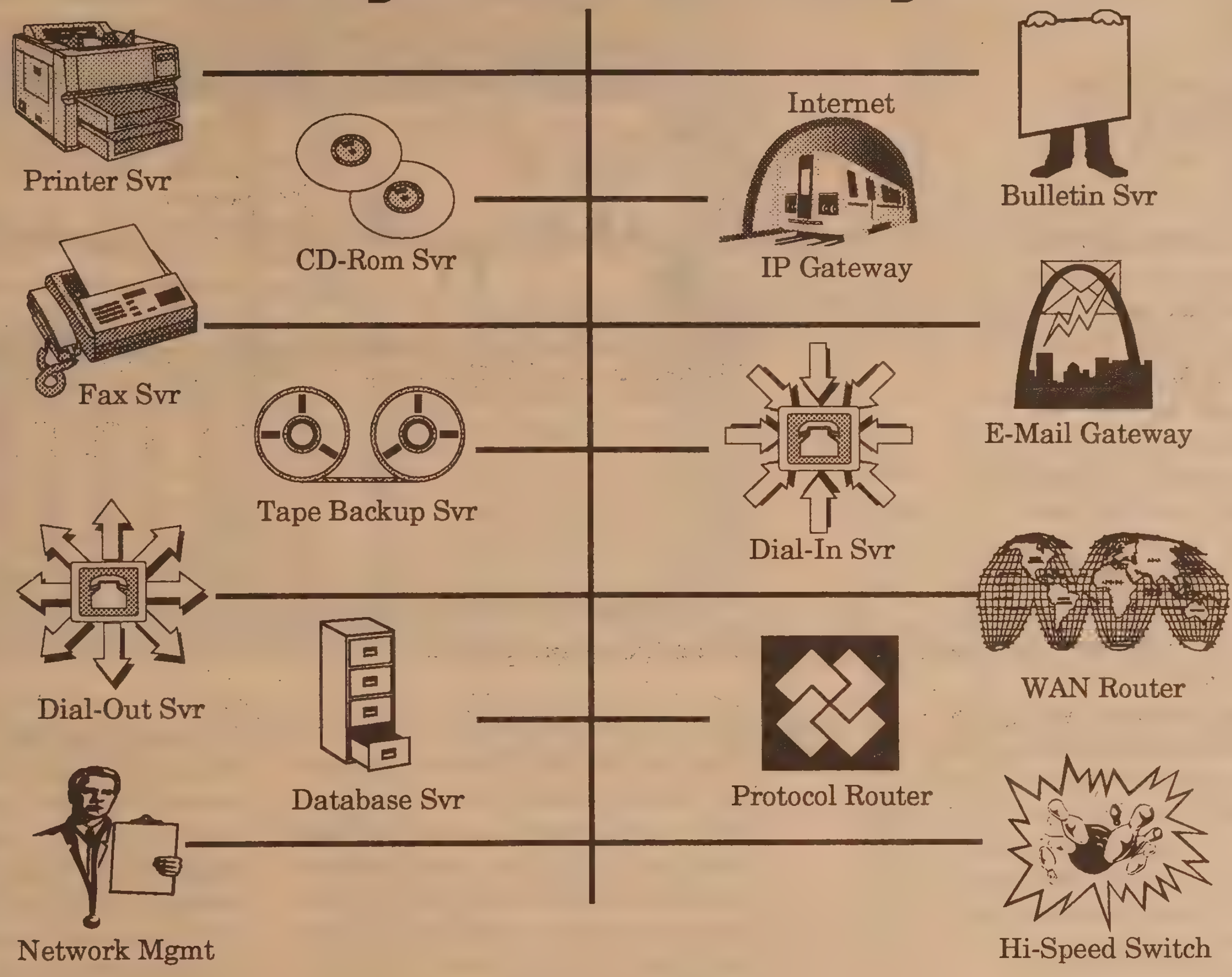
Hummingbird

Does your *NET* work for you?



Printer Svr
CD-Rom Svr
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Bulletin Svr
Fax Svr
Tape Backup Svr
Dial-In Svr
E-Mail Gateway
Dial-Out Svr
Database Svr
Protocol Router
WAN Router
Network Mgmt
Hi-Speed Switch

Novell Gold Authorized Reseller

Novell Authorized Service Center

Novell Unix Master

Novell Net Master

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3COM Etherlink III Coax/TP	$129
SMC Ethercard Ultra 16 Coax/TP	$119
Asante Ethernet Card	$148
Intel Netport II 10T	$425
1000' Cable	$100
AMP BNC Male Conn (10-P)	$30
15' or 25' assembled RG58 Cable	$20
IBM T.R. Patch Cable 8'	$15
Transceiver Cable 3'	$25
Ethernet Transceiver	$45
10BaseT 9-Port Hub	$285
10BaseT 18-Port Hub	$565
2-Port Ethernet Repeater	$399
4-Port Ethernet Repeater	$599
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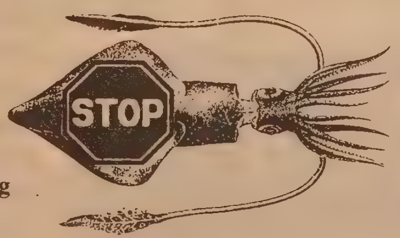

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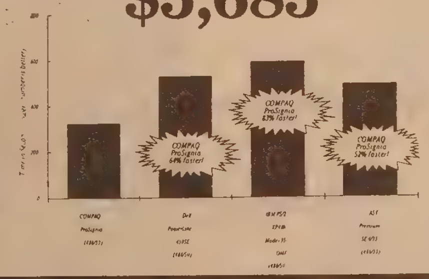

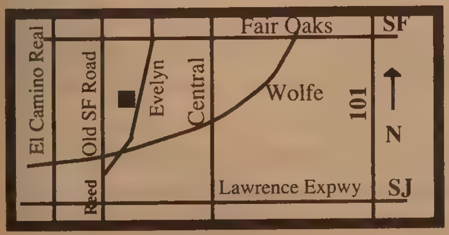

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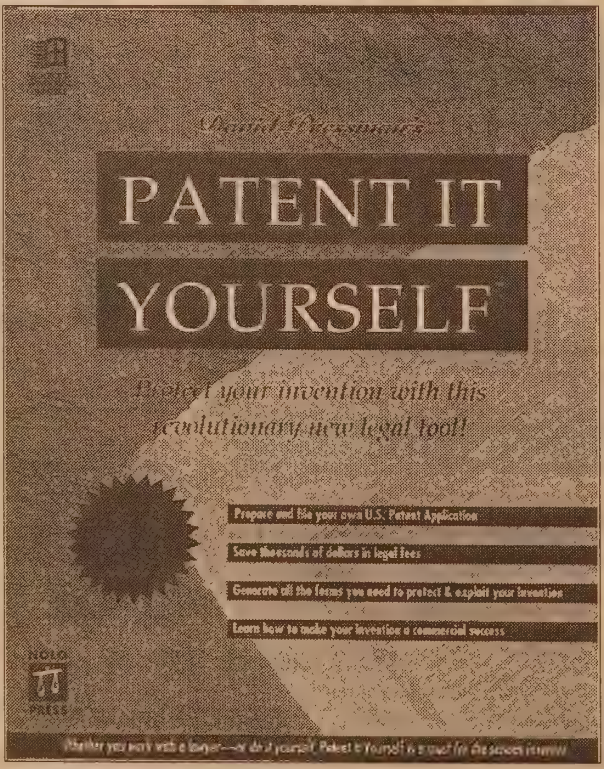
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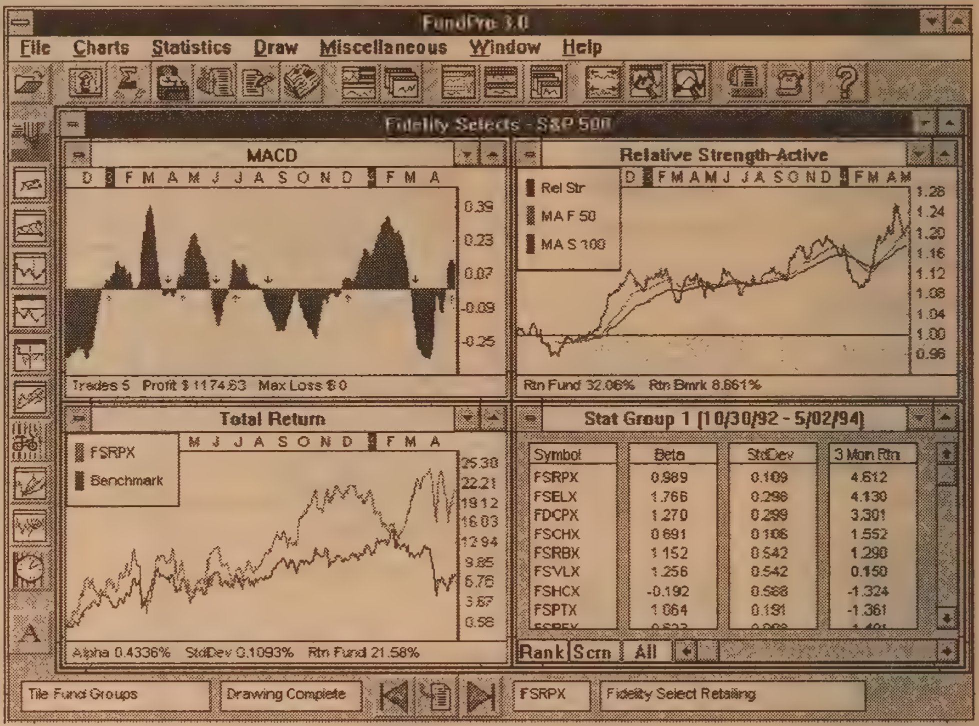
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0.23
0.07
-0.09
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MA F 50
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D F M A M J J A S O N D F M A M
1.28
1.24
1.20
1.16
1.12
1.08
1.04
1.00
0.96
Total Return
FSRPX
Benchmark
M J J A S O N D F M A
25.30
22.21
19.12
16.03
12.94
9.85
6.76
3.67
0.58
Stat Group 1 [10/30/92 - 5/02/94]
Rank
Scrn
All
Tile Fund Groups
Drawing Complete
A

Trades 5 Profit $ 1174.63 Max Loss $ 0

Rtn Fund 32.06% Rtn Bmrk 8.661%

Alpha 0.4336% StdDev 0.1093% Rtn Fund 21.58%

Symbol	Beta	StdDev	3 Mon Rtn
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FSELX	1.766	0.298	4.130
FDCPX	1.270	0.299	3.301
FSCHX	0.691	0.106	1.552
FSRBX	1.152	0.542	1.298
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FSHCX	-0.192	0.588	-1.324
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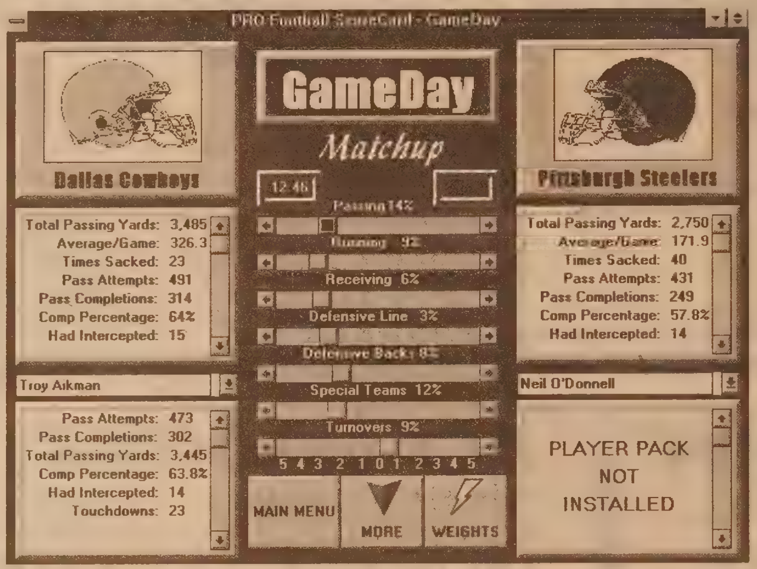

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12.46

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Average/Game: 326.3
Times Sacked: 23
Pass Attempts: 491
Pass Completions: 314
Comp Percentage: 64%
Had Intercepted: 15

Troy Aikman

Pass Attempts: 473
Pass Completions: 302
Total Passing Yards: 3,445
Comp Percentage: 63.8%
Had Intercepted: 14
Touchdowns: 23

Passing 14%
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5 4 3 2 1 0 1 2 3 4 5

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Reviews

Game Reviews

Carriers At War

List Price: $69.95
Design By: Roger Keating & Ian Trout
Published By: Strategic Studies Group
For: IBM 386, 2MB RAM, VGA, mouse required, Adlib/Sound Blaster/PAS/MT-32/Sound Canvas
Reviewed By: Fred Haslam

Carriers at War is a computerized paper game. Some paper games have thousands of pieces and take hundreds of hours to play. By computerizing just such a game, Keating & Trout have built a well-controlled, fast-paced strategy game.

While the game was originally concieved as a traditional paper game, the designers have taken advantage of the computer to simplify several important tasks. The game has extremely nice weather simulation. Enemy units stay hidden until your exploring forces locate them. Pilots are rated Ace, Veteran, Trained, or Green and improve over the course of the game. Any of these tasks would bring a paper game to its knees.

The game has average 16-color graphics, average sound effects, and no music to speak of. The interface is complex and difficult to learn. The AI (artificial intelligence) is also average—it only understands the idea of dominance through superior firepower. This can be challenging, but once you understand the interface, the game becomes a matter of hitting harder, faster, first.

Carriers at War is a decent strategy game (although it is best described as "Operational"). It is extremely good at capturing the "feel" of the era—apprehension, fear, surprise. After learning the system, it becomes automatic. You attack when you are stronger, condense when you are weaker. This game is a good lesson for those who want to learn about WWII, and it is a good wargame for veteran strategy gamers, but for other players it will be overly complex and poorly displayed. (Strategic Studies Group, Inc., PO Box 30085, Pensacola, FL 32503-1085. 904/469-8880)

Lands Of Lore

List Price: $62.99, $72.99 for CD-ROM
Published By: Westwood Studios
For: IBM 386, DOS 5.0, 2MB RAM, VGA/MCGA, Microsoft mouse, all major soundcards
Reviewed By: Fred Haslam

In some ways it is unfortunate that as technology advances, what was once astounding becomes commonplace. Five years ago, Lands of Lore would have blown away everything on the market. Now it is just another point-of-view, role playing/adventure game.

The game is attractive, nicely paced, and has great sound effects. Unfortunately, the game pretends to be a role-playing game (RPG) when in fact it is an adventure game. What's the difference? The primary attribute of an adventure game is puzzle solving. You pick up the red key for the red door and so on. It is possible to get into a situation where you don't have the right key and cannot get it—oops, back to a saved game. Role-playing games

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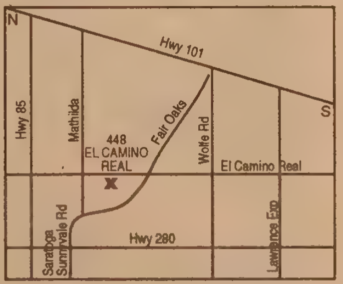

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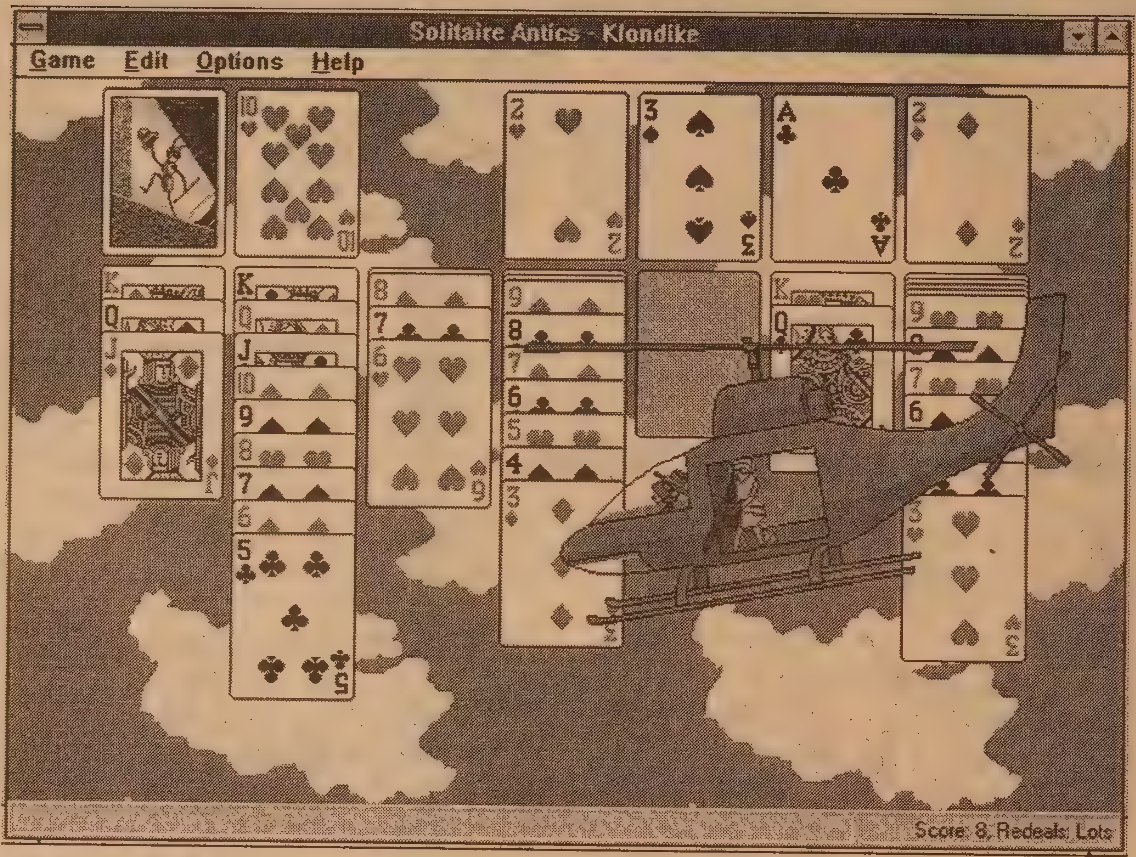

Solitaire Antics from Masque Publishing

emphasize the continued improvement of one or more central characters. The frustration of Lands of Lore lies in having to go back to a saved game after spending an hour or more developing your hero; or worse, not having a saved game with the item you need.

The graphics and sound for Lands of Lore are good quality. The CD-ROM version has the distinctive voice of Patrick Stewart as King Arthur. The interface is easy to learn, although it has a few quirks. Remember that reading scrolls is how you learn spells.

Lands of Lore is not an RPG. It is an adventure game with fighting. As long as you keep this in mind, you should have no problems enjoying the well-developed and imaginative storyline. (Westwood Studios, 3540 W. Sahara Ave., #323, Las Vegas, NV 89195-2246)

Solitaire Antics

Published By: Masque Publishing
For: IBM w/Windows 3.0, VGA, mouse required
Reviewed By: Fred Haslam

Solitaire Antics is solitaire...with antics.

If I sound unenthused, please don't misunderstand. In the realm of Solitaire games, this one is a peach. Like most such games, you have the bonus of never having to shuffle, never getting to cheat, and not needing a deck of cards. It has over twenty different solitaire games, and will teach you each and every one. Further, you can select various deck patterns and desktop backdrops. Oh yeah, and every now and then (every ten minutes or so) animated ants dance accross the screen—or drive a chariot—or hang glide—or, well you get the idea.

The graphics are high-quality 256-color. The artwork is good. There are no sounds

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486DX-50 VLB 256K	465
486DX-33 VLB 256K	335
486SLC2-50 IBM VLB 64K	233
486SLC2-66 IBM VLB	271
486DLC-40 TI	159

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486Sx-25/33	$149/162
386DX-40	99
386SX-40	72
386SX-33	64

MODEMS

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2400 Baud (Ext)	50
Fax Modem (9600 Fax, 2400 Modem)	45
14,400 Modem, 14,400 Fax	118

CD ROMS

Mitsumi Double Speed	$154
SONY 33A Double Speed	155

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84 MB Conner	155
120 MB Conner	175
174 MB Conner	185
213 MB Maxtor	199
340 MB Maxtor	265
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Arcnet 16 Bir Coax 16 Bit	56
Arcnet 16 Bit Combo	59
3 Com 16 Bit 503	158
3 Com 16 Bit 507	183
3 Com 16 Bit 509	132

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1x9-60 3/9 Chip	41/47
1x8-80 2/8 Chip	37/43
1x8-70 2/8 Chip	38/44
1x8-70	48
1x8-60	58
4x9-60	160
4x9-70	158
4x9-80	154
4x8-70 8 Chip	148
4x8-80 8 Chip	145
256x9-80	12
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1x1-70	6.99
1x1-60	6.99
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256x4-70	5.99
256x4-60	5.99
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DeskJet Plotter 4 MB	155

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PS/1 Consultant Ess 1/2/4/8MB	79/99/189/320
386ValuePoint 2/4/8MB	99/179/325
486 Valuepoint 4/16MB	189/595
PS/2 30-286 2 MB	99
50Z,56SX,66SX,70 2/4MB	99/179

INTEL MATH CO's

80287-10 10 MHz	33
80C287-12 MHz	33
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80387DX-16, 20, 25, 33	65
80387DX-25 (Tube)	63

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80C387SX-33	45
80C387DX-20	38
80C387DX-25	40
80C387DX-33	42
80C387DX-40	45

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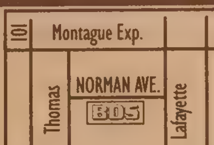

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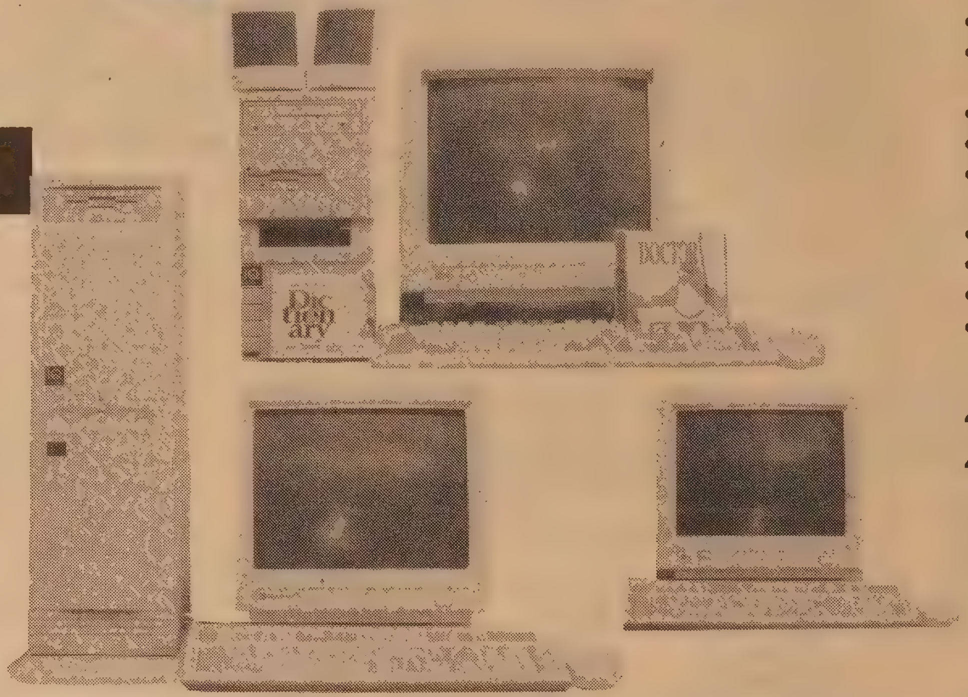

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- Double Speed, 64K Cache
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- Caddy included

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540Mb, 12ms, CFA540A	$409
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540Mb, 12ms, WD2540	$399
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340Mb, Fast, 128K, LPS340A	$249
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SCSI	
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AMI FastDisk NE EISA SCSI	$279
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Orchid Kelvin 64bit PCI 1Mb	$149
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Spider 64bit PCI 2Mb	Call
EISA	
ATI Ultro Pro EISA 2Mb	Call
ISA	
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Orchid Fahrenheit 1280Plus 2Mb	$189
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Orchid Fahrenheit VA/VLB 2Mb	$189
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Spider 256 Cache VLB 1Mb with 256K Cache	$225
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Spider Black Window plus 2Mb	Call
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32bit Cirrus Logic SVGA VLB 1Mb	$79
32bit VLB SVGA 1Mb	$69

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PCI-ISA Pentium 60, 256K, CPU	$1589
PCI-EISA Pentium 66, 256K, CPU	Call
AMI Enterprise III & IV EISA/VLB	
Enterprise III, 486DX-33, 256K, CPU	$845
Enterprise III, 486DX-50, 256K, CPU	$1029
Enterprise III, 486DX2-66, 256K, CPU	$1069
Enterprise IV, 486DX-33, 256K, CPU	$729
Enterprise IV, 486DX2-66, 256K, CPU	$979
AMI Super Voyager VLB-II	
486DX-33, VLB/ZIF, 256K, CPU	$579
486DX2-66, VLB/ZIF, 256K, CPU	$799
486DX2-66, VLB/ZIF, 256K, CPU	$859
ASUS	
486 VLB/ZIF, 128K	$145
486 PCI/ZIF SCSI+IDE+I/O, 256K	$299
586 PCI, 256K	Call
Pentium 90Mhz VLB	$445
MICRONICS	
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ALARIS	
486SLC-50, 128K, CPU	$209
486SLC-66, VLB, 128K, CPU	$259
486SLC3-75, VLB, 128K, CPU	$459
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486DX,VLB/ZIP/Green, 128k	$129
386/486DX, VLB, 128K	$115
386DX-40, ISA, 128K,CPU	$115
386DX-40, ISA, CPU	$95
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AMD 486DX-40mhz	Call
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Cyrix 486DLC-33mhz	Call
Cyrix 486DLX-40mhz	Call
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Intel Pentium 60mhz	Call
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Focus 7000, with Trackbakk	$59
Focus 9000, 129 Programmable	$65

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Desktop, 220 watts Power Supply	$65
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10. MOUSE

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Microsoft Bus Mouse	$59
Logitech Mouseman(serial)	$53
Logitech Bus Mouse	$53
3-buttons serial mouse	$15

11. MODEMS

Online 9600/2400 Faxmodem (int)	$45
Online 96/24 Voice Faxmodem (int	)$69
Online 14.4 Faxmodem(int)	$95
Digital 19.2 Faxmodem	$139
Online 14.4 PCMCIA Faxmodem	$219
USRobitics 14.4 (int)	$110
USRobitics 14.4 (ext)	$140

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Jumbo 250Mb DJ20 (int)	$159
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Conneer	
Tape Stor 250Mb (int)	$13
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Summit	
SE0250 250Mb (int)	$149

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3C503 Etherlink II 16 Coax/TP	$175
3C503 Etherlink II 16 5-Pack	$785
3C507 Etherlink II 16 Coax/TP	$295
3C509 Etherlink III 16 Coax/TP	$145
3C509 Etherlink III 16 5-Pack	$175
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NE2000 Plus 16bit	$115
NE2000 T Plus	$115
NE2000 Plus 3	$129
NE2000 EISA Coax/TP	$539
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Etherexpress 16 5/20pack	$575/$1995
Ethernet Combo PCIA 8100	$129
Ethernet BNC PCIA 8110	$115
Ethernet 10BaseT PCIA 8120	$115
Ethernet Combo/Flash PCIA 8105	$159

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or music. The interface is easy to learn, totally compatible with Windows.

When you come down to it, this is just a solitaire game. It can fill five minutes when you have nothing else to do. People who enjoy solitaire will find this an upgrade from the regular Windows fare. For anyone else, save your money. (Masque Publishing, Inc., PO Box 5223, Englewood, CO 80155. 303/290-9853)

Worlds Of Xeen

List Price: $54.99

Published By: New World Computing

For: IBM 286 or higher, MS-DOS 3.3, CD-ROM, 2MB RAM, VGA, all major soundcards, and Redbook Audio

Reviewed By: Fred Haslam

Worlds of Xeen is two worlds in one! Utilizing the Might and Magic role-playing system, Clouds of Xeen and Darkside of Xeen are two complete adventure worlds. The player is given one party of characters and crosses back and forth to solve puzzles in both realms.

Two worlds is twice the fun! At least that's the theory. If you simply enjoy exploring, as do I, you will have dozens of hours of wide-eyed activity. If you feel like finishing a game, well that's another story. I guesstimate that completing the game will take at least one hundred hours of play, quite probably more. Also, since the world is large, it is easy to wander into an area that is too powerful for the party. Furthermore, certain areas are poorly allocated to the disks—you may find yourself flipping back and forth frequently between CDs.

Graphics for Xeen are top-notch. Music and sound effects are varied and entertaining. Since I have played Might and Magic before, I had no trouble with the interface, but newcomers will probably want to spend some time studying the instructions. Worlds of Xeen is a fine role-playing game. The Might and Magic game system has hammered out most of its problems in previous releases. The world is filled with macro and micro adventures, some of them so strange as to be insane (this is an endorsement).

However, I have one complaint, Xeen came with hint books for both game worlds. I resent that the producers either 1) assumed I'm a moron, 2) designed a game that cannot be finished without a hint book, and 3) charged me extra. (New World Computing, Inc., PO Box 4302,

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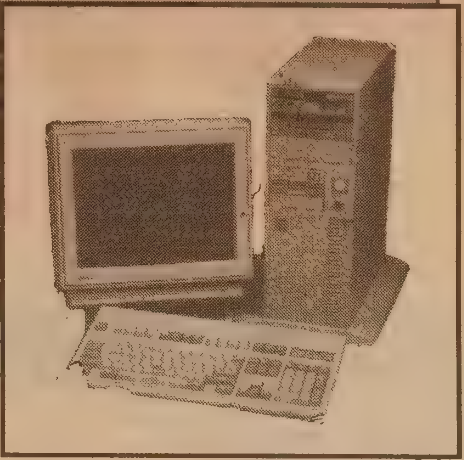

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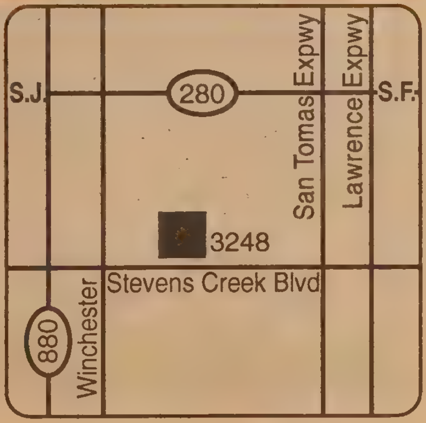

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Netiquette

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Price: $19.95
Reviewed By: Kevin Savetz

This slim book does an excellent job of helping those new to Cyberspace learn the basic tenets of netiquette—or "network etiquette." I can't imagine how much trouble and how many mumbled apologies would be averted if everyone read this book before posting that first message. *Netiquette* is easy to read and loaded with interesting real-life examples. Chapters cover the etiquette of email and of discussion groups as well as providing excellent netiquette guidelines for business, home, and school use. Particularly useful sections cover "electronic style" and the "core rules" of the online world. One chapter covers copyright issues and another the etiquette of email privacy. There's even a tiny chapter on "Love & Sex in Cyberspace."

This book is filled with good advice for living your life online and off. Useful tidbits include: "Don't cheat on your spouse (and if you do, don't do it on company time)," "Don't carbon-copy Steve Jobs on your analysis of the war in Bosnia," and the vague but truest rule of all, "Don't do stupid things." All very good advice. This book should be required reading for anyone thinking of signing on to the Internet, America Online, or any other networked community.

For more information about *Netiquette*, you can send electronic mail to info@albion.com.

Amiga Hardware Review

Video Toaster Flyer

Manufactured By: NewTek
List Price: $3995
Reviewed By: Douglas J. Nakakihara

Continued on page 288

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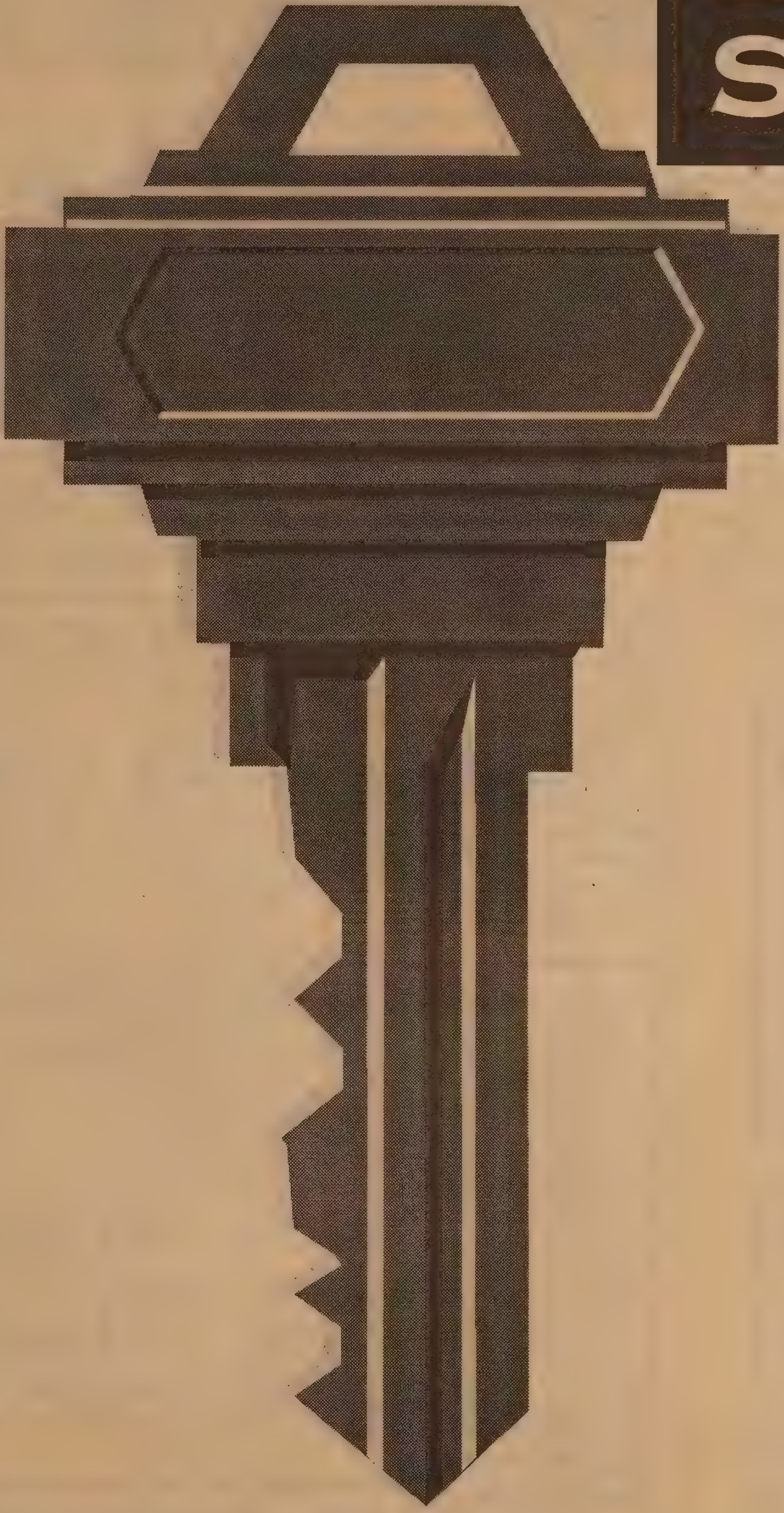

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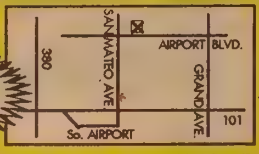

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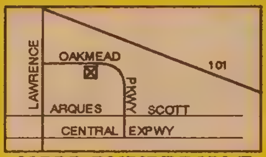

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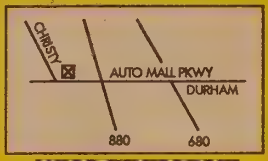

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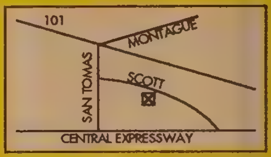

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Motherboard Benchmark Summary

Product	MHz	Cache	Landmark CPU V. 2.0	Pwr Mtr MIPS V. 1.7	Norton SI Computer Index V.6.0	InfoWorld CPU V. 1.0
Excalibur VLB	66	512KB	385.00	47	211.3	80.5
Enterprise IV	33/66	256KB	223.55	29.5	144.5	48.7
Enterprise IV	50	256KB	167.64	22.3	108.4	37.0
Enterprise IV	40	256KB	134.13	17.3	86.6	22.4
Enterprise IV	33	256KB	111.75	14.9	72.2	24.3
SprVoy VLB II	33/66	256KB	223.53	29.1	144.5	48.4
SprVoy VLB II	50	256KB	167.64	22.1	108.4	36.8
SprVoy VLB II	40	256KB	134.2	17.8	86.6	25.9
SprVoy VLB II	33	256KB	111.76	14.8	72.2	24.3

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Resources

Calendar Of Events

Conferences, Shows, Special Events

May

May 31–June 3 Spring Internet '94 Conference & Exhibit. San Jose. Mecklermedia Corporation. Call: 1-800-MECKLER.

June

June 2–4 The Multimedia Conference At VISCOMM West '94. San Francisco. United Digital Artists. Call: 1-800-243-3238.

June 4 California Computer Show And Sale. Cow Palace, San Francisco. Robert Austin Corp.

June 5 Computer, Ham Radio, Electronics Swap Meet. Las Positas College, Livermore. Livermore Amateur Radio Club. Call: (510)447-3857.

June 6–8 Digital World '94 Conference And Exposition. Los Angeles. Seybold Seminars. Call: 1-800-488-2883, (415)578-6900.

June 8–10 Second Annual Virtual Reality And Persons With Disabilities Conference. San Francisco. IEEE and CSU, Northridge. Call: (818)885-2578.

June 9 Stalking Artificial Life: The Hacker And The Ants Free Presentation. San Jose. Computer Literacy Bookshops. Call: (408)435-1118.

June 9–11 CorCon 4: The Fourth ACAD CorelDRAW Conference And Technology Expo. Glendale. Association of Corel Artists and Designers. Call: (818)563-ACAD.

June 11 California Computer Show And Sale. Oakland Coliseum, Oakland. Robert Austin Corp.

June 11 The Computer Show & Sale. Sonoma County Fairgrounds, Santa Rosa. MarketPro. Call: (415)456-6730.

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Life on the Water and Dana Atchley's D3TV announce the opening of The San Francisco Digital Media Center, a new creative center for the public that provides access to six Mac Quadra workstations, computer-based video and audio editing, interactive media authoring, and a complete line of digitizing and storage services for multiple media. The Center also presents Home Movies Intensive Workshops on the third weekend of every month, which allow participants to create QuickTime movies based on family archival material. Other digital media workshops are offered as well. The Center is located at 3435 Army Street in San Francisco. Call (415)824-9394 or email JELLO@well.sf.ca.us for more info.

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FIFTH ANNUAL DIGITAL WORLD CONFERENCE & EXPO

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Digital World is the first and largest industry-independent event focused on the applications and implications of digital technology, as represented by the converging worlds of broadcast, computers, consumer electronics, entertainment, publishing, and telecommunications. This year's event will feature more than 150 exhibitors, over 50,000 square feet of hands-on exhibits, and more than twenty thousand attendees. Call 1-800-488-2883.

SUMMER SEMINARS

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June 12–17 Society For Information Display International Symposium, Seminar, And Exhibition. San Jose McEnery Convention Center. Society for Information Display. Call: (714)545-1526.

June 13–15 NECC '94: The National Educational Computing Conference. Boston. International Society for Technology in Education. Call: Donella Ingham, (503)346-2834.

June 13–16 Online Publishing '94. New York, NY. Graphic Communications Association. Call: (703)519-8160.

June 13–18 SunWorld '94 Conference And Expo. Moscone Center, San Francisco. IDG World Expo. Call: 1-800-225-4698.

June 16–18 Art Teco '94: First Annual United Developers Summit. San Francisco. Morph's Outpost. Call: Tim Bigoness, (510)238-4547.

June 17 Cyber Circus Benefit For Computers And You. Glide Memorial Church. NewMedia Magazine. Call: (415)715-6204.

June 18 Writing For Interactive Multimedia Conference. San Jose. Writers Connection. Call: (408)445-3600.

June 18–19 Computer Show And Sale. Solano County Fairgrounds, Vallejo. MarketPro. Call: (415)456-6730.

June 20–23 NEXTSTEP EXPO '94 Developer And User Conference. Moscone Center, San Francisco. DCI. Call: 1-800-767-2336.

June 20–24 Xhibition '94, Corporate Development Conference. San Jose Convention Center, San Jose. Call: 1-800-234-XHIB

June 21–22 The Customer Service/Certification Connection Conference. Santa Clara. Drake Training & Technologies. Call: Juli Johnson, (612)896-7441.

June 25 & 26 The Computer Show & Sale. Scottish Rite Center, Sacramento. MarketPro. Call: (415)456-6730.

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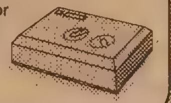
Give your Mac Vision!

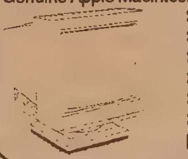
With MacVision (and a video camera) your Macintosh will be able to see the outside world! Capture video stills from any composite video source (camera, VCR, video disk) and you can commit a B & W image to a disk file for editing with your paint program. New in the box unit with cables and power supply. Works with Mac II, SE or Plus, System 4.1+



HSC# 80150 $39.95

Mac Color Monitor

Genuine Apple Macintosh Performa 14" color monitor features:



- ⌘ .39 dot pitch
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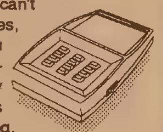
- ⌘ Tilt/Swivel base
- ⌘ New in box with cables, instructions
- ⌘ 90-day warranty

HSC# 80149 $179.95

One-trick Phone Friend

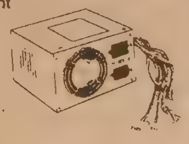
This little novelty was meant as an easy-access dialer for one of the off-brand long distance services. You can't change the pre-programmed access codes, but it will remember the last number you dialed with it, so you could use it as a one-number (16-digits) memory re-dialer. Handy for those midnight overseas calls! Uses three button cells which might need replacing.



HSC#14438 $4.95

Super Computer Deals...

A. "Mini-tower" power supply, fits most Mini- and Mid-size tower cases as well as many small-footprint desk-top cases. 200W, measures 6" x 5.5" x 3.5", has normal motherboard connectors, three large and two small drive connectors and 22" long switch connection leads (switch not included). New! HSC# 14649 $27.50

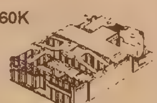


B. "Mini-tower" power supply, same as above but 165W and 10" switch connection leads. New! HSC# 14632 $24.95

C. Everex 2400 Baud Modem PC Board -- (RS-232 external type) 3.25" x 6", no enclosure available, Hayes compatible, new, fully assembled PC Board, works great with ProComm, requires 8-12VDC power adaptor (we have one you can adapt for this). Data sheet & pinout incl. HSC# 14467 $8.95

D. Refurbished 1.44MB half-height floppy drive, Teac FD-235HF. Heads aligned, cleaned, good as new! 90-day warranty. These will go fast! HSC# 14742 Special! Reg. Price ~~$32.50~~ $29.95

E. Used, good condition 5.25" Half-height 360K Floppy disk drive, Teac FD-55BV-11-U. Hurry, 360's are getting even harder to find! 90-day warranty. HSC# 14667 $14.95



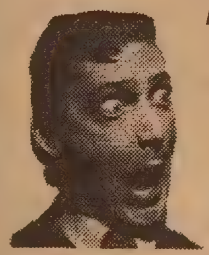
F. Hard/Floppy controller card -- controls up to two floppies and two MFM hard drives, 2:1 interleave. Hurry, MFM cards are no longer being made! DTC 5280 16-bit AT full length card. 90-day warranty. HSC#14680 $24.95

G. Serial Port upgrade kit -- 16C450 UART, 1488 & 1489 chips, bracket & cable. Use with most serial cards. HSC# 14609 $8.50

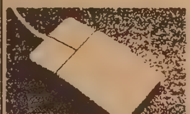
It's More than a Game...It's History!

They should make more computer games like this one..."Their Finest Hour -- The Battle of Britain" by Lucasfilm Games. It is a historically accurate depiction of the air battles that convulsed England during the summer of 1940, and you can relive WW II history by flying a Supermarine Spitfire or a Junkers "Stuka" divebomber (or one of six other fighters or medium/heavy bombers). You get a realistic-looking cockpit instrument panel on your screen, and your chosen craft's performance is based on the actual abilities of the planes. One of the best things about this game (leave it to Lucasfilm to excel in this area!) is the book that accompanies it. It starts off with a 45 page history of the war up to this crucial turning point, and is interspersed throughout with period photographs, campaign maps, profiles and quotes of important personalities, and discussions of strategies. There are even diary entries from British and German fliers that give first-hand accounts of what aerial combat was like in those desperate days. All that is left to experience the realism of battle is to climb into your "cockpit", grab the joystick and follow the mission plan you have built. You can even turn on a "cockpit camera" to record your battle for later viewing. This game was one of the most popular flight simulation games going a couple of years ago, now you can fly along with the aces, and if you are good enough, change history! What a way to painlessly absorb a history lesson, by living it! IBM/DOS, EGA/VGA, AdLib compatible. HSC#14694 $9.95

Huge Mouse Invasion!

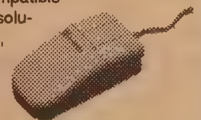


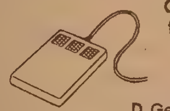
Well, no, enormous rodents are not running around here just yet, but we do have a rather large number of mouse-type pointing devices that are looking for a good home next to your computer! Adopt one today! Eek-eek!



A. High-Quality Optical Mouse (shown at left) -- serial interface (9-pin "D-sub") two-button mouse by Mouse Systems, comes with 7" x 7.75" mousepad. No mechanical parts to wear out or get dirty...no balls to clean! New, with driver disk, OEM version (no book or box). HSC# 14719 $14.95

B. MacPRO mouse -- three-button Mac compatible mouse by Animas (shown at right). 350 DPI resolution, Apple ADB interface (4-pin Mini-DIN) for Mac II, IIc, IIci, IIfx, IIsi, LC, SE, Classic, or other Macintosh computer with ADB port. Programmable "cdev" allows full programmability for all three buttons. You even get a paint program called Colorframe (included on driver disk). New in box with manual, mouse-mat, 90 day warranty. HSC# 14718 $19.95





C. Generic Mouse (Super economy version) -- three-button mechanical mouse for 9-pin "D-sub" type serial interface. New OEM version (sorry, no book, software or fancy box), 100% Microsoft Compatible, should work with most mouse drivers. HSC#14673 $4.95

D. Genereic Mouse (Regular economy version) -- three button mechanical mouse, 100% Microsoft compatible, includes driver software. One year warranty. HSC# MSS3E $7.95

E. Mouse Mat -- got your mouse picked out? Great, now give it something soft and smooth to roll on ...a neoprene Mouse Mat! Reduces fatigue & wear on your mouse, poor little fellow! 9" x 10", neoprene backing and colorful fabric top. HSC# 15-MPAD 99¢

Hard Disk Full? Put the Squeeze on your Data with SuperStor!

There are thousands of ironic stories in Software City, this is only one of them... Before Microsoft came out with DOS 6.0, there were dozens of thriving software companies writing all sorts of useful DOS utilities, including several varieties of Data Compression utilities. One company, Addstor, had a pair of products called SuperStor 2.0 and SuperStor PRO, which were finished, functioning, mature products. Giant Microsoft released DOS 6.0 with a data compression utility included, and Addstor saw their market evaporate. They eventually went under. The irony? DOS 6.0 had problems in the data compression utility, which required the birth of DOS 6.2...at the same time, a lawsuit by another utility provider against Microsoft was upheld, which we hear means that DOS 6.2's data compression utility may not be included anymore! Where does that leave Addstor? Still defunct, we're afraid, and no longer offering support, but we bought the remaining stock of their SuperStor and SuperStor PRO packages, and offer them at these amazing prices! We have had reports that Addstor's compression technology was more robust than some of the other companies' schemes.

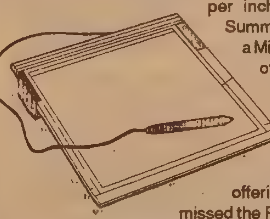
A. SuperStor 2.0 will increase your disk capacity, defragment files, and make better use of your disk space. Need DOS 3.2 or later, not compatible with Zenith or Tandy DOS. HSC# 14674 $6.95

B. SuperStor PRO includes Windows-based JPEG/MPEG compression/expansion utility for .JPG, .BMP, .TIF, .TGA and .PCX graphics files (huge benefits, 20:1 compression typical!), Windows utilities, increased compression and speed over SuperStor 2.0, password protection, Tune-up Analyzer, Integral Disk Cache, Compression Preview, automatic transparent data compression, more! HSC# 14675 $14.95

-- Large quanitities of both types available, dealer inquiries invited! --

Sketch like a pro with HP SketchPro!

Well, the PenMates by Mouse systems featured in last month's ad are long gone. We are sorry if you wanted one but didn't get one, but maybe you will be interested in this item as an "upgrade"...the 7060A SketchPro by Hewlett Packard. It is a medium-format (11" x 11") digitizing tablet with up to 1219 lines per inch resolution, accurate to within .02" and can emulate Summagraphics Bit Pad 2 and Hitachi HDG1111B tablets, as well as a Microsoft Mouse. This allows the SketchPro to be used with most of the popular CAD and graphics programs, such as AutoCAD, Versa CAD and CADKEY. We are offering a brand-new-in-the-box tablet with pen-type pointing device, subtitute power supply and documentation for only $149.00 (list price was $599). A four-button "puck" type cursor is available directly from HP if you prefer that type of input device. We are offering a 90-day warranty on this high-quality U.S. product. If you missed the PenMates, don't miss this one!



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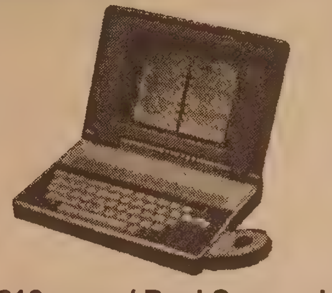

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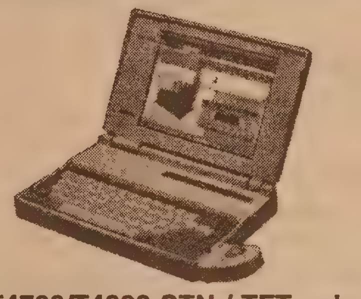

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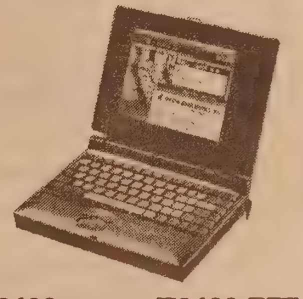

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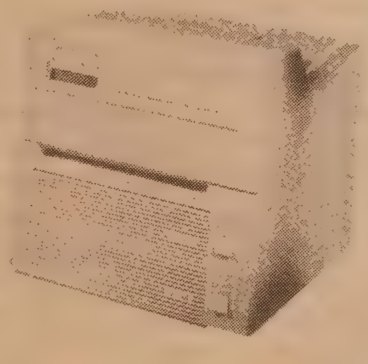

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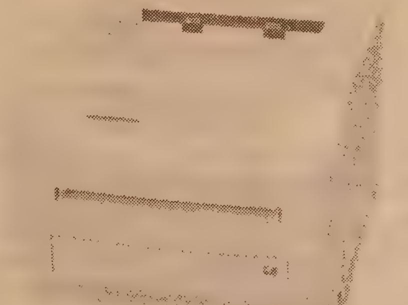

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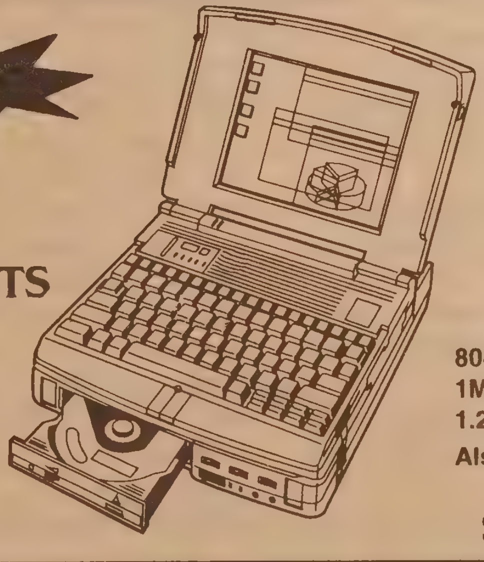

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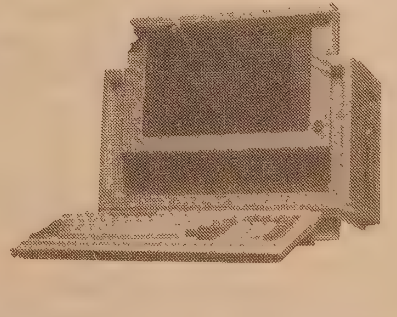

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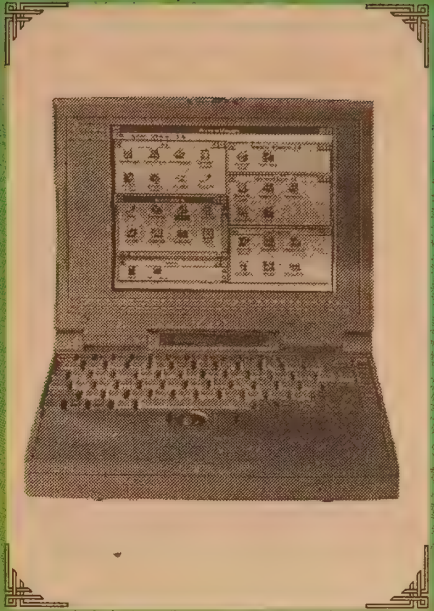

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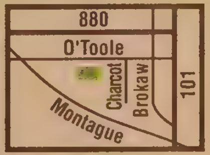

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UMiracle 66MHz $3776

Dare to Compare

[illegible]

- Processor............ 77.01
- Video.................... 1524.52
- Disk...................... 1813

DOSMark.............. 870.66
Graphics WinMark.. 20.7
Disk WinMark......... 1490

Test result based on our 66MHz system.
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Dare to Compare

[illegible]

- Processor............ 68.82
- Video.................... 1461.31
- Disk...................... 1310.00

DOSMark.............. 761.45
Graphics WinMark.. 19.00
Disk WinMark......... 1200

Test result based on our 66MHz system.
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UMiracle

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33SX-$1940
33DX-$2004
40DX-$2027
50DX/2-$2068
66DX/2-$2138

READY TO GO

Dare to Compare

[illegible]

- Processor............ 45.75
- Video.................... 1528.63
- Disk...................... 1110.00

DOSMark.............. 600.31
Graphics WinMark.. 15.4
Disk WinMark......... 1030

Test result based on our 66MHz system.
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33SX-$3234
33DX-$3298
40DX-$3321
50DX/2-$3362
66DX/2-$3432

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	46.51
- Video	1351.86
- Disk	1524
DOSMark	623.14
Graphics WinMark	15.8
Disk WinMark	1240

Test result based on our 66MHz system.
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33SX-$1702
33DX-$1766
40DX-$1789
50DX/2-$1830
66DX/2-$1900

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	45.37
- Video	3665.02
- Disk	1191
DOSMark	698.17
Graphics WinMark	8.55
Disk WinMark	1040

Test result based on our 66MHz system.
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33SX-$1182
33DX-$1246
40DX-$1269
50DX/2-$1310
66DX/2-$1380

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	39.85
- Video	4552.25
- Disk	1044.03
DOSMark	633.09
Graphics WinMark	7.87
Disk WinMark	844

Test result based on our 66MHz system.
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READY TO GO

33SX-$1127
33DX-$1191
40DX-$1214
50DX/2-$1255
66DX/2-$1325

Dare to Compare

PC Bench 8.0 and WinBench 4.0 Result

- Processor	38.13
- Video	4518.43
- Disk	1015.00
DOSMark	609.83
Graphics WinMark	7.19
Disk WinMark	793

Test result based on our 66MHz system.
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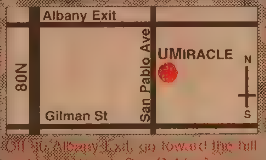

Off 80 Albany Exit, go toward the hill and turn right on San Pablo Avenue. We are facing Albany City Hall. Or off 80 Gilman St. go toward the hill and make left turn on San Pablo Avenue.

FREMONT MAIN OFFICE:
43038 Christy St. Fremont CA 94538
Phone: 510-226-6746 Fax: 510-226-6758
Mon to Sat 9:00AM-7:00PM
Sunday 10:00AM-6:00PM
Yes! We are Open on Sunday!

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UMIRACLE
Auto Mall Pkwy
(Old "Durham")

Off 880 Auto Mall Pkwy (or Old 680 Durham), go west and pass the 680 over-pass, right on second light, we are inside Lincoln Executive Center, the first business park on your right

UMiracle
UMIRACLE MICROSYSTEMS
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1027 San Pablo Ave Albany CA 94706

New Store Open in Albany
No More Long Distance Drive!!

COMPONENTS/UPGRADES

Add and subtract to make your dream machine!

Add and subtract to make your dream machine!

Motherboard without CPU: (Call for CPU Prices)

486 UMiracle Green ISA VLB 256K - 3 VLB, upto 32MB by 30Pin, P5 OD suppt, Bus-master, Full Green PC EPA compliance - able to turn off HD, Monitor horizontal Sync, CPU Slow Dn, Award BIOS	$115
486 AIR-SH ISA VLB 256K - 3 VLB slots, Upto 32MB by 30Pin, ZIF, P5 OD support, Bus-master, Power Saving Mgmt, U.S. Quality	$120
486 AIR-UL ISA VLB 256K - 8 ISA/3 VLB slots, Upto 32MB onbrd, 64MB with Expansion Board, using 30Pin, ZIF, P5 OD support, Bus-master, U.S.Quality	$160
Memory Expansion Card 32MB for AIR-UL	$90
486 AIR-MI ISA VLB 256K - 3 VLB slots, Upto 128MB by 72Pin, ZIF, P5 OD support, Bus-master, VLB IDE, FD, 2S/P/G, Power Saving Mgmt, U.S.Quality	**$245**
486 AIR-MIS ISA VLB 256K - 2 VLB slots, Upto 64MB by 72Pin, ZIF, P5 OD Support, Bus-master, VLB IDE, FD, 2S/P & VLB SCSI-2 w/ Adaptec 6360 chpset, and EZ-SCSI software driver,U.S.Quality	$300
486 AIR-EI Full EISA VLB - 3 VLB Slots, Upto 256MB by 72Pin SIMM, ZIF, P5 OD Support, Bus-master, 8 EISA/3 VLB slots, U.S.Quality (256/512K)	$340/420
486 Micronics ISA VLB JX-30 256K, VLB IDE, I/O	$450
486 Micronics EISA VL BUS 256K, IDE, 2S/P/G, Full size, Flash BIOS, Upto 64MB by 72Pin	$595
486 ISA PCI 256K - 3 PCI, 5 ISA Slots, ZIF, P5 OD Support, Intel Saturn ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas onboard Battery, Phoenix BIOS, onboard PCI NCR SCSI-2 Controller, Complete software drivers for OS/2, NT, UNIX	$295
Pentium P5 PCI 256K - 4 PCI, 4 ISA Slots, ZIF, Intel Mercury ChipSet, Upto 128MB by 72Pin SIMM, Bus-master, Dallas onboard Battery, Phoenix BIOS, onbrd PCI NCR SCSI-2 Controller, 60/66MHz, Complete drivers for OS/2, NT,UNIX	$395
Intel Pentium P5 Premier PCI 256K - 3 PCI/5 ISA slots, Mercury PCI Chipset, Flash ROM BIOS, Upto 128MB by 72Pin SIMM, onbrd PCI IDE, FD, HiSpd I/O, Made by Intel from Ireland	**$335**
SuperMicro P54VL-PCI 512K - 3.3V 90/100MHz P5 support, 4 PCI/2 VLB/5-16Bit ISA slots, ZIF, Bus-master, Upto 128MB by 72Pin, Green PowerSaving, U.S.Made - Highest End You Can Find!!!	**$545**

CPU & Memory: (Prices Subject to Change Daily)

Pentium P5-60/66MHz CPU	$Call
Pentium P5-90/100MHz 3.3V CPU	**$Call**
Intel 486-33SX/33DX/50DX2/50DX/66DX2	$Call
AMD 486-40DX/50DX2/66DX2	$Call
Cyrix 486-33DX/40DX	$Call
8Kx8/32Kx8/128Kx8 Cache Memory	$2/$5/$32
1MB DRAM (44256-70ns DRAMx8pcs)	$40
1MB VRAM (44256-70ns VRAMx8pcs)	$60
1MB RAM SIMM (256K-70ns SIMMx4pcs)	$48
4MB RAM SIMM (1M-70ns SIMMx4pcs)	$Call
16MB RAM SIMM (4M-70ns SIMMx4pcs)	$Call
72Pin 70ns SIMM (4/8/16/32MB)	$170/330/635/1350

I/O Card/Controller Card/Network Card:

Single/Dual Printer Card	$10/15
AT I/O 2S/1P/1G	$12
AT I/O 2S/1P/1G w/ 2 HiSpd UART 16550's	$39
4 Serial Port Card with Cable	$55
16Bit IDE/2FD Controller	$12
16Bit IDE/2FD with 2S/1P/1G	$13
16Bit IDE/4FD 2.88MB support	$29
16Bit IDE/4FD 2S/1P 2.88MB support	$49
16Bit IDE/FD 2S/1P/1G 2.88MB support, HiSpd 16550 UART's on Serial ports	**$55**
VLB IDE I/O Controller with 2HD/2FD 2S/1P/1G	$18
VLB IDE/4FD with I/O Support 2.88MB, with 2 HiSpd UART 16550's, 1 Parallel	$45
Promise DC-4030VL-2 VLB IDE w/ 0MB Cache	$115
UltraStor 34F SCSI-2 VLB Bus-Mastering	$225
Adaptec 1522 SCSI FD Controller (Bare)	$79
Adaptec 1522K SCSI FD Controller w/ Kit	$135
Adaptec 1542C Bus-master SCSI FD (Bare)	$175
Adaptec 1542CK Bus-master SCSI FD w/ Kit	$235
Adaptec 2742T RISC-based EISA SCSI-2 (Bare)	**$280**
Adaptec 2742T RISC-based EISA SCSI-2 Controller w/ Dual Channel supporting 14 HDs, 2.88M	$345
Adaptec 2842VL VLB-to-Fast SCSI-2 Controller w/ 2.88MB Support & Driver Kit	$268
Adaptec 2940 PCI Fast PCI SCSi-2 (Bare)	**$230**
Adaptec 2940 PCI Fast PCI SCSi-2 with Kit	**$295**
QLogic PCI Fast Wide SCSI-3 Controller w/ Complete Drivers, Corel SCSI V2.0, Supports 15 SCSI devices, internal 68 and 50 pin connectors, Plug & Play, Upto to 20MB/sec, RISC Processor, Async/Sync Fast Wide SCSI Transfer	**$265**
AIR QAccess Fast SCSI-2 VLB Controller w/ Adaptec 6360 Chipset and EZ-SCSI Software w/ VLB IDE/FD and 2S/1P/1G	$128
External SCSI-2 Adapter for QAccess/MIS/Any Onboard internal SCSI interface	$30
Ethernet NE2000 Adapter Coaxial/10-Base T	$42
Intel/3 COM/Novell/SMC Network Adapter	$Call

Video Card:

16Bit 512K/1MB Trident SVGA 1024x768	$38/55
16Bit 1MB Tseng-4000 72Hz 32K Color	$68
Tseng-ET4000 VLB 1MB 16.7M Color	$85
Tseng-ET4000-W32 VLB 16.7M Color 1MB/2MB	$108/148
Cirrus Logic 5428 VLB 1MB/2MB	$84/124
SPiDER VLB CL-5426 1MB/2MB	$85/125
SPiDER VLB Plus CL-5428 1MB/2MB	$95/135
SPiDER 64 VLB/PCI CL-5434 2MB DRAM	**$193**
SPiDER Black Widow VLB X15IIT 1MB/2MB	$137/197
SPiDER Black Widow Plus X16IIT VLB / PCI Version 1MB/2MB	**$180/240**
Tseng-ET4000-W32i PCI 2MB	**$195**
Orchid Fahrenheit 1280 PLUS VLB 1MB/2MB	$125/185
Orchid Fahrenheit VA VLB 1MB/2MB	$145/205
Orchid Kevin 64 Cirrus Logic CL-GD5434 VLB or PCI version 1MB/2MB DRAM	**$165/205**
Orchid Celsius VLB 1MB/2MB	$128/188
Diamond Speedstar Pro VLB 1MB	$98
Diamond Stealth 24 VLB 1MB DRAM	$129
Diamond Stealth Pro VLB 1/2MB VRAM	$218/278
Diamond Stealth 64 PCI 2MB VRAM S3-964	**$325**
Diamond Viper VLB 2MB VRAM 44M Winmarks	$338
Diamond Viper PCI 2MB VRAM 85M Winmarks	$338
ATI Graphic Ultra Pro VLB Mach32 Engine 2MB VRAM	$280
ATI Graphic Ultra Pro PCI Mach32 Engine 2MB VRAM	$299
ATI Graphic Pro Turbo VLB/PCI 2MB/4MB	**$439/645**
Matrox MGA II PCI 2MB VRAM	**$428**
Matrox MGA II Plus PCI VRAM 2MB/4MB	**$513/695**

Monitor:

Impression 14" 1024x768x0.39DP	$185
KFC 14" 1024x768x0.28DP	$220
KFC 14" 1024x768NIx0.28DP	$240
KFC 14"1024x768NIx0.28DP Low Radiation MRPII	**$280**
KFC 14" Multisync 1024x768NIx0.28DP Digital-Control,Non-Glared	$318
KFC 15" Multisync 1280x1024NIx0.28DP Digital-Control,Non-Glared,Flat-Screen Green Pwr Saving, Screen Shape Contrl	$395
KFC 17" Multisync 1280x1024NIx0.26DP Digital-Control,Non-Glared,Flat-Screen Green Pwr Saving, Screen Shape Contrl	$739
MAG MX15FG Green 15" 0.26DP,1280X1024NI	**$595**
MAG MX17FG Green 17" 0.26DP, 1280x1024NI	**$885**
Viewsonic 15EX 15" 76Hz Green .28DP MPR-II Digital Control, Flat Screen NEW!!!!	**$435**
Viewsonic 15 15" 0.26DP 1280x1024NI Digi.Cntl	$438
Viewsonic 17G 17" Green W/On-Screen Cntrl	$768
Viewsonic 17 17" 0.28DP 1280x1024NI Digi.Cntl	$929
Viewsonic 20 20" 0.28DP 1600x1280NI Digi.Cntl	$1548
Viewsonic 21 21" 0.26DP 1600x1280NI Digi.Cntl	$1748
Nanao F340iW 15" 0.28DP 1024x768NI	$589
Nanao F550iW 17" 0.28DP 1280x1024NI	$1038
Nanao F560iW 17" 0.26DP 1280x1024NI	$1295
NEC 3FGe 15" 0.28DP 1024x768NI	$519
NEC 4FGe 15" 0.28DP 1024x768NI 76Hz	$629
NEC 5FGe 17" 0.28DP 1024x768NI	$999
NEC 5FGP 17" 0.28DP 1280x1024 OptiClear	$1129
NEC 6FG 21" 0.28DP 1280x1024 74Hz	$2290
NEC 6FGP 21" 0.28DP 1280x1024NI OptiClear	$1995

Modem:

14.4K Fax/Data Internal 16550UART	$98
US Robotics Sportster 14.4K Data/Fax 16550UART V32.bis, V.32, V.42 Internal/External	$110/134
Intel Fax Modem 14.4K Data/Fax 16550UART w/ Winfax Lite, Internal/External	$119/135
Intel SatisFaxtion 400 14.4K Data/Fax, internal, 80186 co-processor, line-sharing	$245

Floppy Drive/Tape Backup:

Teac 1.2M 5.25"/1.44M 3.5"/2.88M 3.5"	$44/35/84
Teac Dual 1.44M & 1.2M	$105
Toshiba 2.88M 3.5"	$58
Colorado 250MB TapeBackup Internal	$145
3M Tape Cartridge DC2120 for 250MB QIC-80	$15
Conner SoftStor Anaconda 1.3GB 2750 SCSI-2 1/4" DAT Backup 36MB/Min Internal	$799
Conner SoftStor Anaconda 2.0GB 2800 SCSI-2 1/4" DAT Backup 36MB/Min Internal	$999

KeyBoard/Mice/Software/Chassis/PS/Misc:

Dell 101 Enhanced Keyboard PS/2 or standard	$28
KeyTronic 101 Enhanced U.S. Made	$28
Focus 2001 101 Enhanced Click w/Cover	$32
Focus 8000 111 with Calculator	$40
Focus 9000 129 Programmable w/Calculator	$55
NorthGate OmniKey 101/102	$74
MS Compatible 3-Button Mouse	$8
Logitech Serial First Mouse/Mouseman	$20/30
Logitech Bus Version Mouseman	$65
Logitech Trackman Combo	$70
Logitech Mouseman Cordless	$75
MicroSoft Ergonomic Serial Mouse V2.0	$25
MS DOS 6.2/Windows V3.11	$35/35
Standard Mini Tower with 200W PS	$50
Premium Case w/230W Mini/Desktop/Med	$65/70/90
Premium Case w/250W Full Size Tower	$110
Power Supply PS-II Type 230W UL / 300W UL	$42/85
486 CPU Cooling Fan	$8
P5 Pentium 60/66MHz CPU Cooling Fan	$13
P5 Pentium 90/100MHz CPU Cooling Fan	$16
Chassis Second Cooling Fan 3" or 3.5"	$18
Printer Cable 6"/10"/15"	$5/7/9
Motherboard External Battery	$5
Motherboard Crystal for 25/33/40/50/66MHz	$5

CD-ROM Drive:

Plextor CD-3028 SCSI-2 240ms, 330KB/Sec, Double-Spd Multi-Session Photo CD. internal	**$265**
Toshiba XM-3401B SCSI 256K Cache,200ms 330KB/Sec, Multi-Spin/Spd Internal	$288
NEC Triple Spd MultiSpin 3Xi Internal Orginal	$465
NEC Triple Spd MultiSpin 3Xi Int. CDR-510	$365
Mitsumi DblSpeed 250ms 300kb/s w/controller	$138
Panasonic CR-562 320ms - need no caddy	**$155**
AT Interface CD-ROM Controller with Software	$25
150W Amplified MultiMedia PS-290 Speaker	**$95**
120W Speaker w/ 4" Woofer + 2" Dome Tweeter	$75
TopTek 80W Amplified Stereo Speaker	$56
Media 690 Hi-Fi Amplified Stereo Speaker	$40
LabTec CS-550 Amplified Stereo Speaker	$30
CD-ROM Caddy	$4
Audio Cable - CD-ROM to Sound Card	$5

Sound Card:

ProAudio Spectrum 16 w/ SCSI Interface	$99
ProAudio Studio 16 w/ SCSI Interface	$129
Sound Blaster Deluxe 8 Bit	$50
Sound Blaster Pro Deluxe 8 Bit	$69
Sound Blaster 16 Basic	$98
Sound Blaster 16 SCSI	$165
Sound Blaster 16 SCSI with ASP	$195
Sound Blaster 16 MultiCD	$135
Sound Blaster 16 MultiCD with ASP	$169
Sound Blaster 32 AWE	**$275**

MultiMedia Package:

Creative Labs Discovery CD 8 Upgrade Kit	$295
Creative Labs Discovery CD 16 Upgrade Kit	$339
Creative Labs Edutainment CD 16 Upgrade Kit	$389

HardDisk

Western Digital

340MB IDE WDAC2340	$240
420MB IDE WDAC2420	$258
540MB IDE WDAC2540	$370

Maxtor

345MB IDE 7345AT 64K 14MS	$258
548MB IDE MXT7546A 256K 13MS New!	$395
345MB SCSI 7345S 64K 14MS	$335
540MB SCSI MXT540S 256K 8MS	$548

Quantum

270MB IDE LPS270A 128K 12ms	$220
340MB IDE LPS340A 128K 14ms	$255
540MB IDE LPS540A 128K 14ms	$424
340MB SCSI-2 LPS340S 128K 14ms	$295
540MB SCSI-2 LPS540S 128K 12ms	$378
1.2GB SCSI-2 ProDrive PD1225S 512K 10ms	$895
1.8GB SCSI-2 ProDrive PD1800S 512K 10ms	**$965**
1.08GB Fast Wide SCSI-3 Empire Series 1080S 512K 9.5ms 3.5"	**$765**

Hewlett Packard

1.05MB SCSI-2 HPC2247 10.5ms	$795
2.1GB FAST SCSI-2 HPC2490 8.9ms	$1535
2.47GB FAST SCSI-2 HPC3010 11.5ms	$1700

PC Upgrades and Service Welcome
Our Technical Staff can Troubleshoot
and Pinpoint your Problem Fast!

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**Bolded items indicate new items we have added

**Red prices indicate newly lowered prices

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018	MARIO'S MISSING/ WORLD ATLAS	$17
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020	NATIONAL GEOGRAPHIC MAMMALS	$19
021	REFERENCE LIBRARY BY STW	$15
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065	CROSSWORD CRACKER	$22
066	DESERT STORM	$17
068	EDUCATION MASTER	$19
069	ELECTRONIC LIB OF ART VI	$25
072	EUROPEAN RACER BY REVELL	$55
073	FAMILY CHOICE	$19
075	FAMILY DOCTOR MPC	$19
076	FAMILY EDUCATION COLLECTION	$19
077	FONT MASTER I	$19
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079	FUTURA GAMES	$16
080	GAME MASTER	$19
081	GAME PAK III (CHALLENGE PAK)	$23
082	GAME PAK II	$30
084	GREAT CITIES VOL. 1.0 & VOL.2.0	$17
086	GUINESS DISC MPC 1993	$19
088	INDIANA JONES FATE ATLANTIS	$25
089	KGB WORLD FACT BOOK	$31
091	KODAK PHOTO ACCESS	$15
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193	LOTUS 123 WIN SHAREWARE	$79
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268	SUPER GAMES FOR WINDOWS	$14
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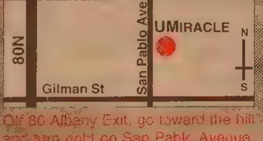

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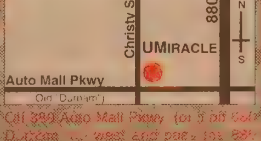

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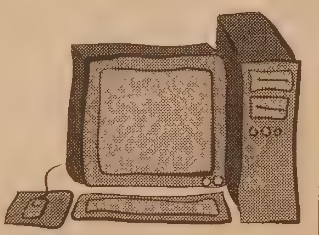

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Bay Area BBSes

By Kathleen Creighton

Dare To Not Be Stupid Online

Remember the old days, when online crime consisted of making available pirated software, or stolen credit card numbers? And then there was the occasional public threat on the life of the president. (Hint: Kids, don't try this at home unless you'd enjoy having your meals served up in federal prison.)

Life online was dull, and news agencies never paid much (if any) attention. Then along came the "kiddie porn" cases and the sex and outrage angle was too good to pass up, especially during sweeps week.

I don't mean to trivialize the existence of predatory pedophiles online, but the actions of a few were starting to shape the public perception of the activities of twenty-one million Americans. Lately, however, the reporting of online behavior has branched out, and we're now being served up stories about the alleged Prodigy "stalker" and the Green Card Lawyers.

It's actually refreshing, in a perverse kind of way, to see that we have all manner of miscreants online, that the seamy underbelly of telecommunications is much seamier than unwary Americans ever imagined. Crime, crime, it's everywhere, no one is safe. Film at 11.

Online Street Smarts

At the same time, though, how can I address the naivete of people new to telecom without giving the impression I'm blaming the (potential) victim? I've already counseled against giving an online service carte blanche to one's credit card, and said you should never, ever use a debit card. As more goods and services become available online, not typing in that credit card number to make a purchase is going to be more and more inconvenient. We exercise discipline or we take our chances.

When first online, many people are so excited by the possibilities of this kind of communication that it does not occur to them to be self-protective. While we're taught in real life that we can minimize our potential as victims by avoiding certain places at night, walking assertively, looking people in the eye, and not carrying a purse, there are not codified parallel rules online. And since specific incidents tend to be encapsulated in time and space, new users can be online for quite a while before hearing about them, if they ever do.

The commercial services don't want to make life online look inhospitable—after all, many of us go there to escape the ills of urban life. They would rather that users perceive life online as a virtual Disneyland. And although it's likely that none of us would march around in Union Square with a sandwich board proclaiming our names, addresses, and telephone numbers (such an unsavory crowd in Union Square, you know), we think nothing about revealing personal details in public, online, in full view of anyone who happens along.

One advantage of folks advertising personal details in Union Square, though, is that we could verify for ourselves gender and age. There are people, mostly men, who pretend to be women. (I have never heard of a case of a woman doing this unless it was a journalist writing an article.) There are adults who pretend to be teenagers. And of course there are men and women pretending to be all manner of things they are not, some to gain advantage, others to gain sympathy. There have been hair-raising tales all around. This is not a new phenomenon—it goes way back to the earliest days of telecommunications. It's just that these days there are orders of magnitude more unsuspecting, potential victims.

Continued

PC WORLD #1 "BEST BUY"

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N433VL BEST BUY

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- ☐ 8MB memory, 128KB cache
- ☐ 3 VL-Bus (VESA Local Bus) slots
- ☐ Pentinum-ready ZIF socket
- ☐ 270MB hard drive
- ☐ 32-bit VL-bus IDE controller
- ☐ 1.2MB or 1.44MB TEAC floppy drive
- ☐ Genoa VL-Bus Graphics with 1MB
- ☐ 14" SVGA color monitor, .28mm
- ☐ 2 serial/1 parallel/1 game port
- ☐ Logitech 2-button mouse w/pad
- ☐ MaxiSwitch NOVA 101 keybaord
- ☐ Desktop case with power supply

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PC World Top 20

N466VG EnergyStar

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- ☐ 3 VL-Bus (VESA Local Bus) slots
- ☐ 256KB cache, ZIF socket
- ☐ 340MB hard drive
- ☐ 2MB VL-bus caching IDE Controller
- ☐ Both 1.2MB & 1.44MB TEAC floppy drives
- ☐ Diamond 32-bit VL-Bus Graphics w/2MB
- ☐ 15" non-interlaced .28mm SVGA color monitor with LED display (1280x1024)
- ☐ 2 serial/1 parallel/1 game port
- ☐ Logitech 2- button mouse w/pad
- ☐ MaxiSwitch NOVA 101 keyboard
- ☐ Desktop case with power supply

$2,395

with 486DX-33 CPU	**$2,265**
with 486DX2-50 CPU	**$2,299**

OPTIONS for *N466VG Energy-Star*:

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420MB IDE hard drive	Add	$20
540MB IDE hard drive	Add	$115
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Orchid Kelvin VLB w/2MB	Sub	$90
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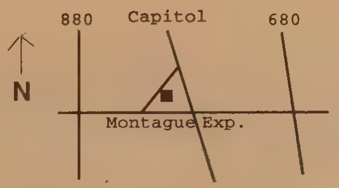

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- 386 CPU/Motherboard
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- 2MB RAM
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- Mini Tower Case w/230W P.S.
- 101 Enhanced Keyboard
- Microsoft Compatible 3-Buttons Mouse

$1259

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- 486SX-33 Local Bus M/B
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Bus Logic BT445S VLB SCSI-II w/Kit	$265
Bus Logic BT545KT Bus Master	$210
Promise DC4030VL-II IDE Cache Ctrl.	$119
Vision 32Bit VL Bus IDE Ctrl. w/IO	$28
ISA IDE Ctrl. Card w/IO (1gm., 2srls	$15

PRINTERS

Canon B J-200e	$call
Canon B J-600	$call
HP Desk-Jet 500/520/500C/550C	$call
HP Laser-Jet 4/4L/4M/4P/4ML	$call
Panasonic 2023/2123 24Pins	$198/$237

CASES WITH POWER SUPPLY

AT Desktop w/230 Watts Power Supply	$54
Mini Tower w/230 Watts Power Supply	$49
Medium Tower w/230 Watts P.S	$75
Full Tower Case w/250 Watts P.S	$92
Super Tower Dual Fans w/300 Watts	$159

MULTIMEDIA

CD-ROM DRIVES

Mitsumi Dual-Speed 250ms 300Kb/Sec	$139
NEC 3XI Tri-Speed 190ms 450Kb/Sec	$479
NEC OEM Tri-Speed 190ms 450Kb/Sec	$358
Panasonic Dual-Speed 300Kb/Sec	$139
Phillips Dual-Speed 300Kb/Sec	$145
Sony Dual-Speed 300Kb/Sec	$139
Sony 562 SCSI 285ms 300Kb/Sec	$325
Toshiba 340 1B SCSI-II 200ms 330Kb/Sec	$309

SOUND CARDS

Creative Labs Sound Blaster 16 Basic	$109
Creative Labs Sound Blaster 16 Deluxe	$147
CL Sound Blaster 16 MCD/w ASP	$149/175
CL Sound Blaster 16 SCSI-II/w ASP	$175/199
Creative Labs Wave Blaster	$178
Diamond Sonic 16	$99
Media Vision Pro 16 Basic	$109
Media Vision Pro Audio Spectrum	$125
Media Vision Pro Audio Studio 16	$125
Orchid Game Wave	$144
Orchid Sound Wave	$189

VIDEO CARDS

DIAMOND	
Speedstar Pro VLB or ISA 1MB	$128
Stealth 24 VLB or ISA 1MB	$145
Stealth Pro ISA 1MB/2MB	$230/$310
Stealth Pro VLB 1MB/2MB	$240/$319
Viper VLB 2MB VRAM	$345
Viper PCI 2MB VRAM	$399
GENOA	
8500VL Turbo PCI/VLB	$105
Phantom 32i PCI/VLB 2MB	$245/$215
HERCULES	
HG310 Graphite Pro ISA 1MB VRAM	$269
HG420 Graphite Pro ISA 2MB VRAM	$395
HG610 Graphite Pro VL Pro1MB VRAM	$279
HG720 Graphite Pro ISA 2MB VRAM	$398
MATROX	
MGA PCI/2	$449
MGA PCI/2 Plus 2MB	$529
MGA ULT2VH Ultima AT 2MB	$489
MGA ULT2AH Ultima VLB 2MB	$489
MGA IMP3AH Impression AT 3MB	$719
MGA IMP3V Impression VLB 3MB	$719
MGA IMP3VH Impression 3MB	$789
MEDIA VISION	
Pro Graphics 1024 VLB 16.7Meg Colors w/2MB	$349
Pro Graphics 1280 VLB 16.7Meg Colors w/2MB	$645
NUMBER NINE	
9GXe Level 10 ISA 1MB VRAM	$250
9GXe Level 11 ISA or Vesa 2MB VRAM	$345
9GXe Level 12 ISA or Vesa 3MB VRAM	$408
9GXe Level 14 ISA	$590
9GXi Lite Level 20 1MB VRAM	$530
9GXi Lite Level 21 1MB VRAM/1MB DRAM	$690
9GXi Level 23 ISA or MCA w/2MB	$990
9GXi Level 25 ISA or MCA w/3MB	$1260
9GXi Level 29 4MB VRAM 1MB DRAM	$1375
ORCHID	
Fahrenheit Plus VLB 1MB/2MB.	$115/$160
Celsius VLB 1MB/2MB VRAM	$198/258
SPIDER GRAPHICS	
Spider 32 VLB 1MB/2MB	$105/$149
Spider Plus VLB 1MB/2MB	$115/$159
Black Widow 1MB/2MB VRAM	$175/$230

FAX MODEM

Digicom 14400bps Fax/Modem (upgrd)	$115
Digicom 16200bps Fax/Modem	$140
Online 9600/4800 Internal Fax/Modem	$45
Online 14400bps Internal Fax/Modem	$99
USRobotics Sportster 14400bps Internal	$119
USRobotics Sportster 14400bps External	$154
Zoltrix 14400bps Internal Fax/Modem	$105
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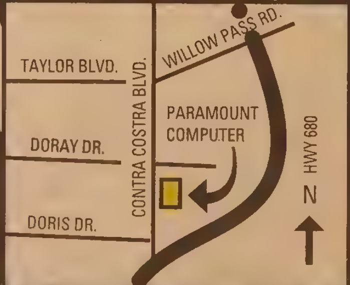
Fri: 10 am – 6 pm
Sat/Sun: 11 pm – 4 pm

Prices and availability subject to change without notice. Not responsible for typographical errors. One year parts & 3 years labor on all systems.



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PARAMOUNT COMPUTER

BULLETIN BOARDS cont.

and federal info. [Exp. #125.]

The Silicon Matchmaker. (408)492-9700. 24 hrs., 14,400. 20 lines, email, chat, Internet mail, personal introductions. [Exp. #124.]

The Source BBS. (408)946-6000. 24 hrs., 14,400. 15,000+ files: Windows, DOS, programming, graphics, GIFs, UNIX, NT, games, text, word processing. Free. Sysop: Tom Dillon. [Exp. #123.]

The Support Network BBS. (408)259-0297. 8-N-1, 2–8 pm. 14,400. Assistive Technology info, large selection of educational files. Now with RIP graphics. Sysop: Frank Arnold. [Exp. #123.]

Thunder Mountain BBS. (408)266-4553. 8-N-1, 1200–14,400. Eight lines, chat, matchmaker, files, games, CD-ROM. Family oriented. Free. [Exp. #124.]

The Virtual Reality BBS. (408)246-5434. 8-N-1, 14,400. Games, files, and Net mail. Free. Sysop: Jim Busby. [Exp. #123.]

The Warped Disk. (408)288-6890. 14,400. Four lines, files, CD-ROM, chat, forums, photo database, adult areas, RIP graphics, free RIPterm. Free. Sysop: Woody Musson. [Exp. #124.]

415

Anatomically Correct BBS. (415)856-8425. 24 hrs., 14,400. Adults only, discussions of adult issues, more than 100 X-rated stories. Massage parlor guide, "Cheri Chat" and "Horrorscope" doors. No GIF files. Free. Sysop: Howeird. [Exp. #124.]

Career Connections. (415)917-2129; 917-2125. 8-N-1. View and respond online directly to the recruiters. Telnet: career.com . Free. Sysop: S. Dave. [Exp. #126.]

Clipboard. (415)239-0454. 28,800. Pcboard, Clipper files, FidoNet/Intelec/Internet/OS2Net (Mac, job listings, for sale), and doors. Sysop: George Jereza. [Exp. #125.]

The CyberDen. (415)472-5527. 14,400. The worldwide alternative music and entertainment network, Mac/PC GUI, Usenet and Internet support. [Exp. #125.]

Fog City. (415)863-9697. 8-N-1. Gay & lesbian community/chat, matchmaking, CD-ROMs, games, multiline, 2.4GB. Since 1986. [Exp. #124.]

Golden Gate Computer Society BBS. (415)457-2516. 24 hrs., 2400–14,400. Four nodes; ILink, Cal-Link, and Usenet. Downloads OK during first call. [Exp. #124.]

!Great Divination! (415)327-6748. 8-N-1, 2400. The greatest multiplayer online game, Sorcery. Warning: Addictive. Free trial. Sysop: Gendflor Silvren. [Exp. #123.]

Home Buyer's Fair! Online. (415)570-7133. 24 hrs., 9600. Market, title, first-time home buyer information; current mortgage rates. [Exp. #125.]

Hotline Computers BBS. (415)349-5136. 14,400. Computer users subjects, 2.5+GB files, classifieds, online shopping. Free. [Exp. #124.]

IBBS West. (415)564-9996. 8-N-1, 24 hrs., 300–14,400. Five lines, PC & compatibles, Internet mail, shareware, utils., adult GIFs, two CD-ROMs, 13,000. Fee. [Exp. #124.]

InfoDude Communications. (415)855-9500. 14,400. Multiplatform BBS supporting IBM, Mac, and Amiga; chat, files, PC-SIG online. [Exp. #123.]

The Informer BBS. (415)468-6713, 468-6714, 468-6715. 24 hrs., 2400–28,800. Intelec, FamNet, WildNet, Fido, OS/2 net operating systems, tech specs, and more. Sysop: John Custer. [Exp. #124.]

Key Software Products BBS. (415)364-9847. 5 pm–8 am M–F; 24 hrs. wknds. 1200/2400/9600. Tech support for the Last Byte Memory Manager. Internet email, fax-mail. Free. Sysop: Dan Lewis [Exp. #124.]

LegalNet. (415)454-0772. 14,400. The California legal community is now online at 14.4 and $6/month. [Exp. #123.]

Marin Online. (415)457-1884. 14,400. The online community of Marin. Sysop: James Preston. [Exp. #123.]

The MIDI & Multimedia Exchange BBS. (415)771-1788. Music and multimedia and virtual reality data files and programs; .MOD, .MID, etc. Sysop: Walt Perko. [Exp. #124.]

Near Side BBS. (415)369-5063. 1200–14,400. Software support, many online games, growing transfer sections. Reg. requested. Sysop: Adam Tordoff. [Exp. #125.]

New Dork Sublime. (415)864-DORK, 255-NERD. 14,400. As seen in the National Enquirer, two lines, NIRVANAnet. [Exp. #123.]

Recovery BBS. (415)255-2188. 8-N-1, 300–14,400 + HST. Dedicated to 12-step recovery programs (AA, NA, Al-Anon, CoDA, SAA, etc.). Fido 125/9. Sysop: Rich Gorin. [Exp. #125.]

The Road Not Taken. (415)648-8462. General conversation, discussion of current issues, miscellaneous blather. Free. [Exp. #123.]

San Francisco Digital BBS. (415)362-2227. 8-N-1, 14,400. Two lines, online databases, build your own BBS online, online applications deployment. Free 20 min./day/caller. [Exp. #125.]

San Francisco PC Users Group BBS. (415)621-2609. 8-N-1, 24 hrs., 1200–14,400. Sysop: Richard Couture. [Exp. #125.]

The Shareware Exchange! (415)992-4320. 8-N-1, up to 14,400. Six networks, 345MB files, 10,000+ msgs., 35+ online games. Sysop: Christopher Jong. [Exp. #125.]

The Skull BBS. (415)637-9077. 28,800. 16 nodes, 20GB, hottest Asian/adult graphics, over 18 only, home of The Skull CD-ROM. Free trial. [Exp. #125.]

Solar Hydrogen BBS. (415)494-3116. 24 hrs., 1200–14,400. Alternative energy info—prosperity without pollution. Sysop: Howard H. Smith. [Exp. #124.]

Springboard. (415)327-4591. 14,400. Eight lines, Reuters & AP news, Internet, live newstalk. Free 30-day trial. Sysops: Wendie, Mike, Lisa, Bob, and Scott. [Exp. #124.]

Symmetrics BBS. (415)382-6679. 8-N-1, 24 hrs., 1200–14,400. Online games, 600+MB of shareware programs. [Exp. #124.]

Uncle D's Directory. (415)364-3001. High-speed US Robotics. Computer online service for the mentally aroused. 1.5GB games, unprotects, RIME, classifieds, doors. Free. [Exp. #125.]

VidGame BBS. (415)742-6486, 2400–16,800; 742-6618, 28,800. Six nodes, steamy adult GIFs, games, 7.5+GB/two CD-ROMs. Free Internet email and newsgroups. Sysop: George Hassmer. [Exp. #124.]

Wetware Diversions Public UNIX. (415)826-0397. 8-N-1, 24 hrs., 1200/2400. 8 lines, full UseNet news. Sysop: Eric Swanson (editor@wet.UUCP). [Exp. #125.]

Window World BBS. (415)931-0649. 24 hrs. For people who use Windows-type software; info, shareware, chat. Sysop: Bob Cram. [Exp. #124.]

Wine-Tasters' Bulletin Board. (415)459-1948. 24 hrs., up to 14,400. Gigabyte stroll through the wines of the US. Wine country events and more. Instant access. [Exp. #124.]

510

& The Temple Of The Screaming Electron. (510)935-5845.

Continued on page 321

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BBS Spotlight cont.

I don't want to give the impression that there's a crackpot or a con under every user I.D. That's obviously not the case. If there were, people would get educated in a hurry. In fact, it's because crackpots and cons are relatively rare that people online—even those who know better—get complacent. And kids cannot be expected to think ahead to the possible ramifications of email correspondence with "Little Timmy."

What's required here is a dose of "street smarts" online. Do not post your address and telephone number publicly. (You'd think this would be obvious but I've seen this countless times.) If you have a listed phone number, you might want to be somewhat guarded about posting in what specific town you live.

If for some reason your address is going to be public (there are a number of special-interest group USPO mailing lists), you might consider getting a post office box or a commercial mail service box, and unlisting your phone number. At the very least, have the number published without your street address. And think two or three times about the kind of information you put in your Internet .plan file if it's public, and in your Internet .signature file, if you have one.

When you post online, you have no idea who's reading what you write. Be careful about employer details (the person reading could be your boss), and about family details (the person reading could be your estranged spouse's best friend). Assume everything you write, including email, could end up on the front page of the *New York Times.*

Similarly, stress these guidelines to children, along with the usual rules about not giving any personal information, such as the comings and goings of parents, siblings, or caretakers. Under no circumstances should a child be posting or emailing about being home alone. Children are enthusiastic about the medium and make "friends" quickly and easily. This is part of their charm. But if a child is old enough and responsible enough to be online, then the child is capable of following rules parents set down. And parents should actively monitor the online activities of their children. That is the role of parents, not the government.

Take responsibility for your personal safety and peace of mind. Have a good time, but be careful out there. ■

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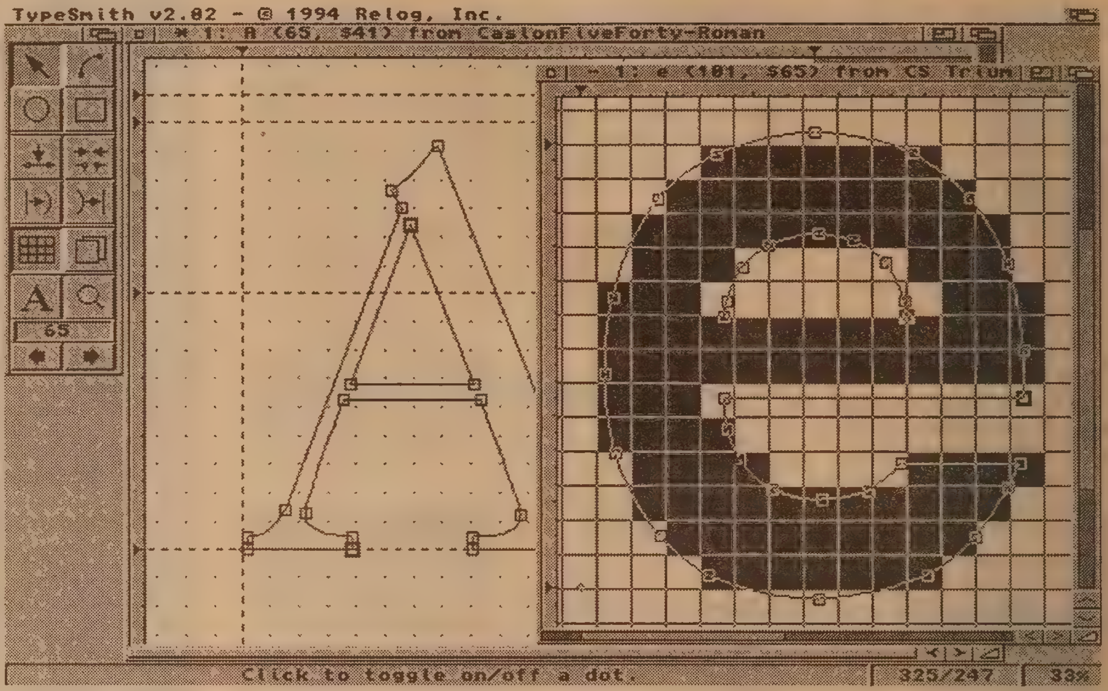
Continued from page 264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* 1: A (65, $41) from CaslonFiveForty-Roman
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65
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TypeSmith v2.02 from Soft-Logik Publishing Corp.

The Video Toaster Flyer is a nonlinear video editing system for the Commodore Amiga. The Flyer offers D-2 quality video and CD quality audio editing in a tapeless environment, with a drag-and-drop storyboard interface. Data is stored using NewTek's proprietary NTASC codec, which offers lossless or lossy compression superior to MPEG and JPEG. Video sequences can be used in Lightwave, and Lightwave frames can be sent directly to the Flyer. Requires an Amiga 2000/3000/4000, two SCSI-2 hard drives (twenty-one maximum), CD-ROM, TBC, and any Video Toaster card. Connects via internal ribbon cable. (NewTek, Inc., 1200 SW Executive Dr., Topeka, KS 66615. 913/228-8000)

Amiga Software Review

TypeSmith v2.02

Published By: Soft-Logik Publishing Corp.
List Price: $199.95
Reviewed By: Douglas J. Nakakihara

Soft-Logik has upped the ante again with its newest release of TypeSmith, its outline font editor. TypeSmith is still a great tool for creating and editing outline fonts (PostScript Type 1 and 3, Compugraphic Intellifont, and Soft-Logik formats), but it now supports bitmapped font editing.

Bitmapped fonts can be created from scratch or generated based on any outline font. Bitmapped and outline fonts are superimposed on each other, making it very easy to "tweak" generated bitmapped fonts. Also featured is the ability to automatically trace bitmapped characters to create outline fonts.

The editing tools and interface have been cleaned up, beefed up, and streamlined, making TypeSmith even easier to use. Font dimensions can now be set by dragging arrow guides inside the window. You can now also open multiple fonts and even copy and paste between them.

Hinting is now featured for PostScript Type 1 and Compugraphic fonts. This reportedly improves the appearance of fonts at small sizes and low resolutions. TypeSmith comes with a superb manual and AmigaGuide online help. ARexx is fully supported.

TypeSmith still has problems creating Compugraphic fonts from very complex PostScript fonts, but most fonts convert fine. The program also lacks support for TrueType fonts, a PC standard, and Amiga font metric files. (I guess they have to leave something for the next version.)

TypeSmith is a must for anyone doing serious desktop publishing. Even video enthusiasts can benefit from TypeSmith now that the Video Toaster supports PostScript fonts. (Soft-Logik, PO Box 510589, St. Louis, MO 63151-0589. 1-800-829-8608)

Art Department Professional 2.5

Published By: ASDG, Inc.
Price: $299, upgrade $45
Reviewed By: Douglas J. Nakakihara

ASDG has upped the ante once again with the lastest version of ADPro. The entirely revamped interface uses floating windows, which can be opened on the Workbench, and a public or a custom screen. The main window can be button- or list-based. The rendering screen supports most 24-bit graphics boards and can optionally be a sizable window on the main screen. Pull-down menus and hot-keys have also been added.

Support for CDXL, Digital Broadcaster, FLC and FLI anims, MS Windows, and Workbench icon files is now featured. Savers for the Retina, Picasso, EGS, DPS PAR, and Video Toaster are included as well. Additionally, the PrefPrinter saver now supports the Fargo Primera color printer. When compositing images, a range of colors can be defined as trans-

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INTEL 486DX2-66 128C VLB	$435	$575	$825	$960	$1,095	$1,410
INTEL 486DX2-50 128C VLB	344	480	730	868	1,005	1,320
INTEL 486DX-33 128C VLB	319	455	705	845	980	1,295
INTEL 486SX-33 128C VLB	175	310	560	698	835	1,150
INTEL 486SX-25 128C VLB	155	290	540	678	815	1,130
AMD 486DX2-66 128C VLB	394	530	780	918	1,055	1,370
AMD 486DX2-50 128C VLB	299	435	685	823	960	1,275
AMD 486DX-40 128C VLB	290	425	675	813	950	1,265
IBM 486SLC2-66 64C VLB	285	425	675	810	945	1,260
IBM 486SLC2-50 64C VLB	240	375	628	765	898	1,213
INTEL 486DX2-66 128C ISA	427	565	818	955	1,088	1,400
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INTEL 486DX-33 128C ISA	312	450	700	835	970	1,285
INTEL 486SX-33 ISA	158	295	545	685	815	1,130
INTEL 486SX-25 ISA	135	275	525	660	795	1,110
AMD 486DX2-66 128C ISA	387	520	770	905	1,040	1,355
AMD 486DX2-50 128C ISA	287	425	675	815	945	1,260
AMD 486DX-40 128C ISA	282	420	670	810	940	1,255
IBM 486SLC2-50	175	315	565	698	835	1,150
486DLC-40 128C w/Math Chip	165	300	550	688	825	1,140
386DX-40 128C	90	238	488	625	758	1,073

UPGRADES:	Please Add
AIR VLB 128K Motherboard	$40
Genoa VLB 256K Motherboard	45
210 MB H.D.	25
250 MB H.D.	45
340 MB H.D.	80
420 MB H.D.	100
540 MB H.D.	210
14" .28 Monitor	25
14" .28 Non-Interlace Monitor	45
15" .28 Non-Interlace Monitor	150
VLB IDE/IO	15
Promise VLB IDE/IO w/512K	95
Orchid Fahrenheit VLB 1 MB	100
Orchid Celsius VLB 1 MB	100
SVGA Card VLB 1 MB	35
Spider VLB 1 MB	60

BASIC SYSTEMS CONFIGURATION:

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Panasonic CD-562	$145
Toshiba XM 3401 B SCSI CD-ROM	$305
Spectrum 16 Bit SCSI Sound Card	$110
Sound Blaster 16	$99
Sound Blaster Pro	$80

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170 MB	$175
210 MB	190
250 MB	205
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IDE/I/O VLB Card w/Cable	20
Promise DC 420 VLB w/512K	105
Promise 4030 VL-II VLB (Exp to 16 MB)	120
Adaptec 1542 C SCSI	170
Adaptec 2842 VESA SCSI	280
Adaptec 2742 EISA SCSI	300

MODEMS

Fax Modem (9600 Fax, 2400 Modem)	$38
Fax Modem (14400 Fax, 14400 Modem)	90

MONITORS

14" Mono Amber	$75
SVGA (1024x768) .39	185
SVGA (1024x768) .28	205
SVGA (1024x768) .28 NI	220
ViewSonic 6E	280
Impression-5 15"	320
ViewSonic-15 E15"	365
ViewSonic-15 15"	430
ViewSonic-17G 17"	780
NEC 3V	455

VIDEO CARDS

Mono Graphics	$15
Trident SVGA, 512K RAM	38
Trident SVGA, 1 MB RAM	60
Trident SVGA, 1 MB RAM, VLB	70
Cirrus Logic 1 MB, VLB	70
Orchid Fahrenheit SVGA, 1 MB, VLB	135
Orchid Celsius 1MB/2MB	125/175
Diamond Stealth 24/Pro 1MB	140/240
Diamond Viper 2 MB VRAM, VLB Accelerator	340

MISCELLANEOUS

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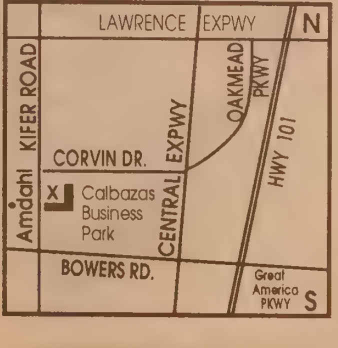

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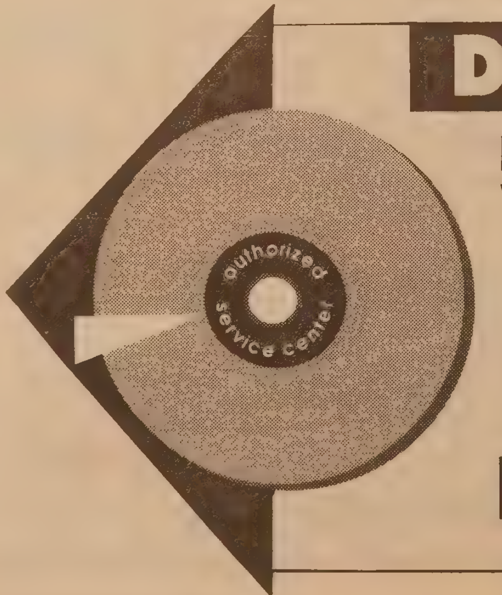

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parent. New operators include a brightness evener and an IFF brush pattern applier. The palette editor doesn't work correctly with 24-bit graphics cards so you'll have to send its screen to a normal Amiga screen.

Most of the ADPro ARexx scripts have been rewritten for this version, but there aren't many totally new ones. However, there are a lot of new scripts and features for FRED, including film/video frame rate conversion and alpha channel compositing. The all new manual now boasts 529 pages and includes more tutorials. The index, although larger, could still use some beefing up.

Version 2.5 improvements are much more than window dressing, they will increase your productivity. ADPro continues to be a must-have. (ASDG, Inc., 925 Stewart St., Madison, WI 53713. 608/273-6585)

Software Accessories Review

PaperTemplates

Published By: PaperDirect
List Price: $39.95 (Macintosh Word version reviewed)
Reviewed By: Matthew Leeds

It's hard to get attention these days. It seems like it takes a multi-million-dollar budget to advertise, a horde of public relations persons to contact the press, and a blue ribbon design firm to do package design. With the rapidly expanding home office shift being fed by corporate downsizing and the entrepreneurial spirit, it takes some marketing savvy to recognize a good thing.

PaperDirect is one of those recognizable good things. It's a mail order catalog company that sells unique paper products for business, desktop publishers, and others who need small to large quantities of preprinted or specialty paper products.

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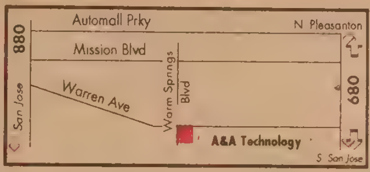

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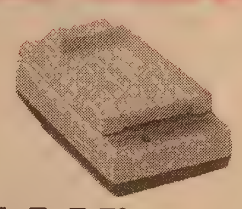

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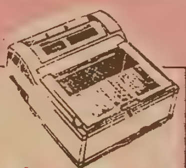

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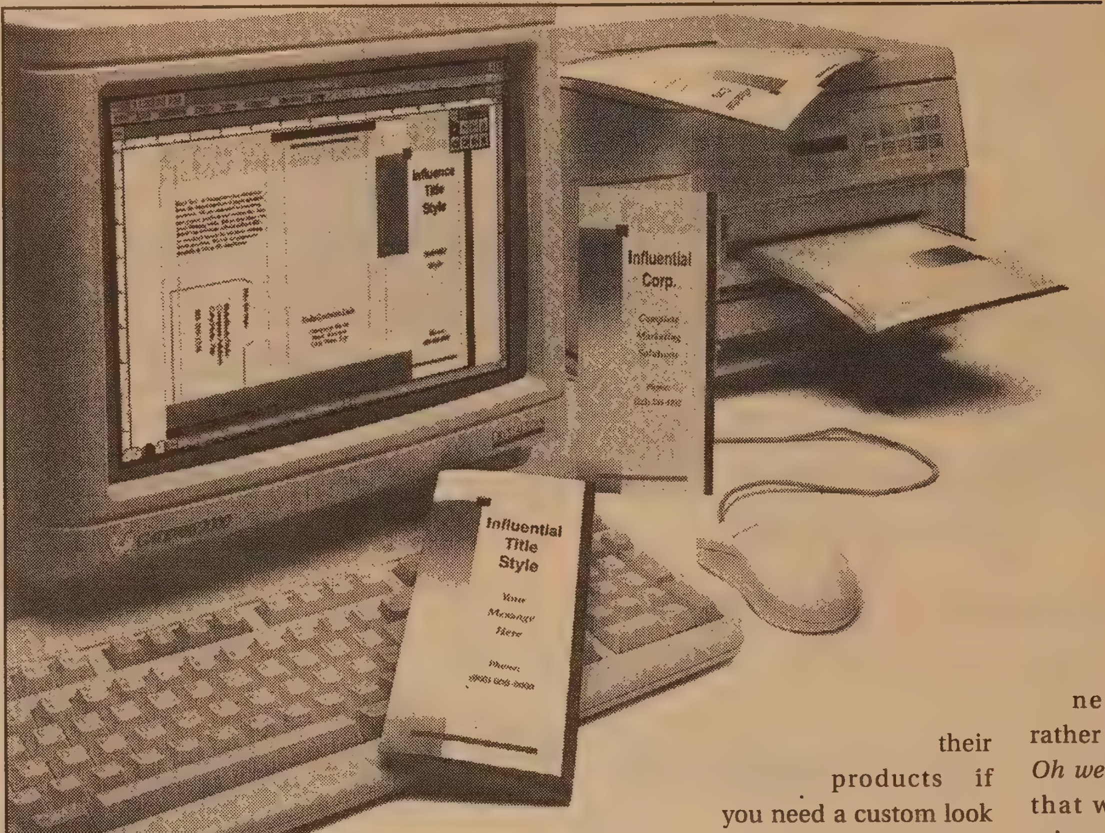

PaperDirect's DTP and word processing templates

templates support PaperDirect's preprinted paper, labels, cards, and certificates. They also include more than twenty clip art images and two outline fonts.

The templates come compressed in self-extracting archives. Using them is simple since you just open the template in your application and follow the on-screen prompts. The manual includes any additional details you'll need to use the templates. Each package of paper includes a preprinted practice template that you can photocopy and use to test with.

PaperDirect also offers a sample pack of their paper products. I highly recommend their products if you need a custom look for your printed materials. (PaperDirect, 205 Chubb Ave., Lyndhurst, NJ 07071. 1-800-A-PAPERS)

CD-ROM Review

The Personal Daily PlanIt

Published By: MediaVision
List Price: $59.95
Reviewed By: Woody Liswood

I am in a love/disappointment relationship with the Daily PlanIt.

On the love side, it contains some *great* video footage of things I like, such as extreme skiing, and it looks great on the screen with a variety of buttons to press to get to the individual parts of the planner.

On the down side, the planner just isn't as good a PIM as Lotus Organizer, which is my current favorite.

This Windows-based, CD-ROM-based product must stay in the CD-ROM drive so it can access the maximum amount of video. That means I can't keep it and my Lotus Multimedia both alive on my system. Perhaps I need to have a CD-ROM jukebox rather than a singe drive in my system. *Oh well*, disk-based products have been that way since the beginning of the microcomputer revolution.

When installed, you can get the PlanIt Adrenaline from Warren Miller Entertainment. Warren Miller has been an idol of mine for over three decades. I love his ski movies. The skiing and other sports clips on the CD-ROM are worth buying the CD-ROM for even if you don't use the planner. Just show off the video to your friends.

You can also get video of PlanIt Paradise, with swimwear and associated models. The final option is PlanIt Earth with video and pictures from the National Wildlife Federation.

The metaphor which gets in the way, for me, is the cutsey other stuff in the planner. There are trivia questions from Isaac Asimov, Motivation Messages each day, a list of famous birthdays, jokes of the day, supposedly humorous quotes, and even a daily fortune cookie. Now with all that, what about the planner? It is there, with a name and address book, appointments, and all that.

There is a section in the documentation about using your voice to work with the Daily PlanIt. You can tell it what to do, record verbal messages, or do voice annotations as necessary using Dragon System's Talk-To Plus. I did not attempt to try these options, since I couldn't see talking to myself with my own planner.

If you don't already use a personal planner, and have a multimedia computer, this product is really worth taking a very close look at. If you already use one of the PIMs like Lotus Organizer or Pack Rat, you will be disappointed by the plan-

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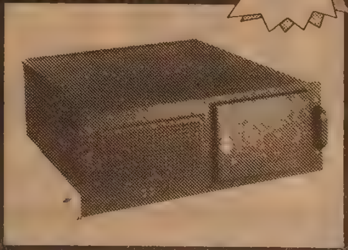

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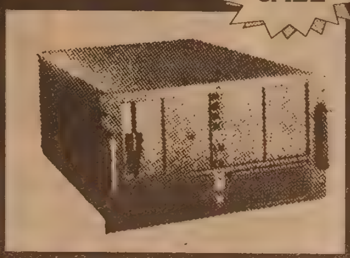

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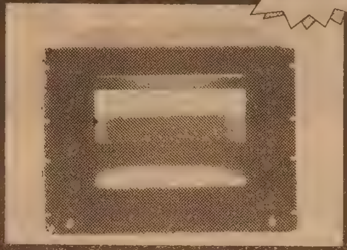

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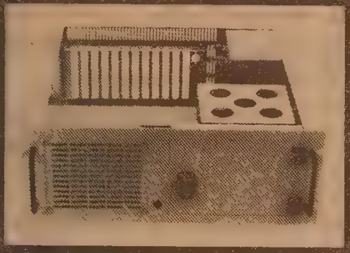

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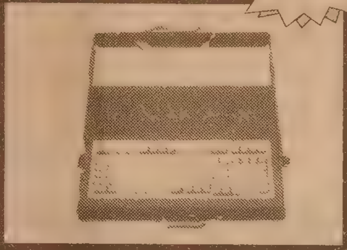

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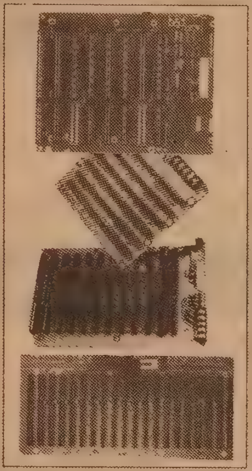

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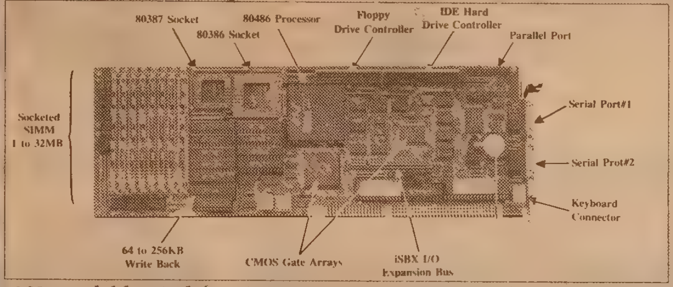

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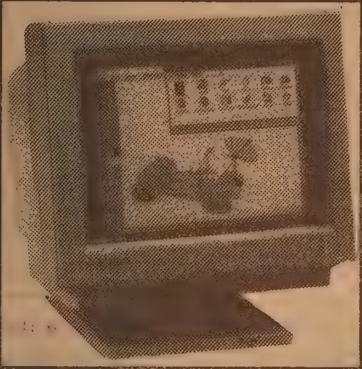

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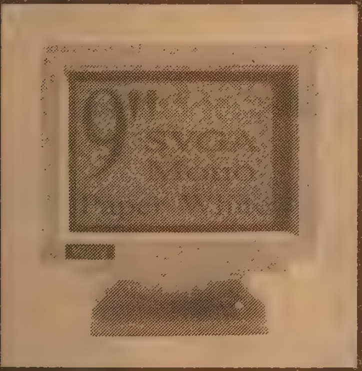

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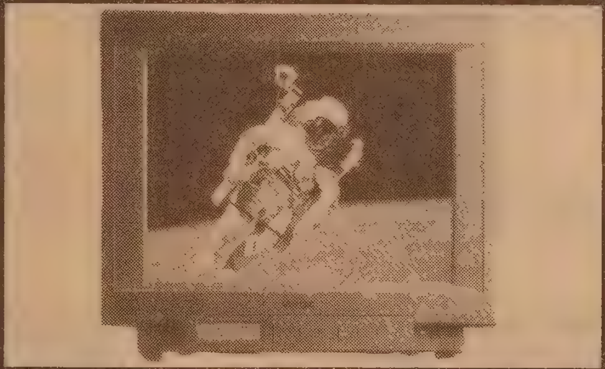

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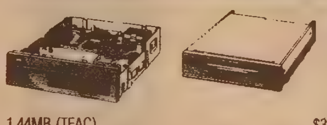

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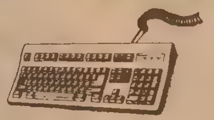

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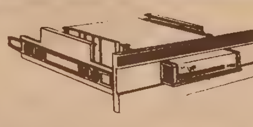

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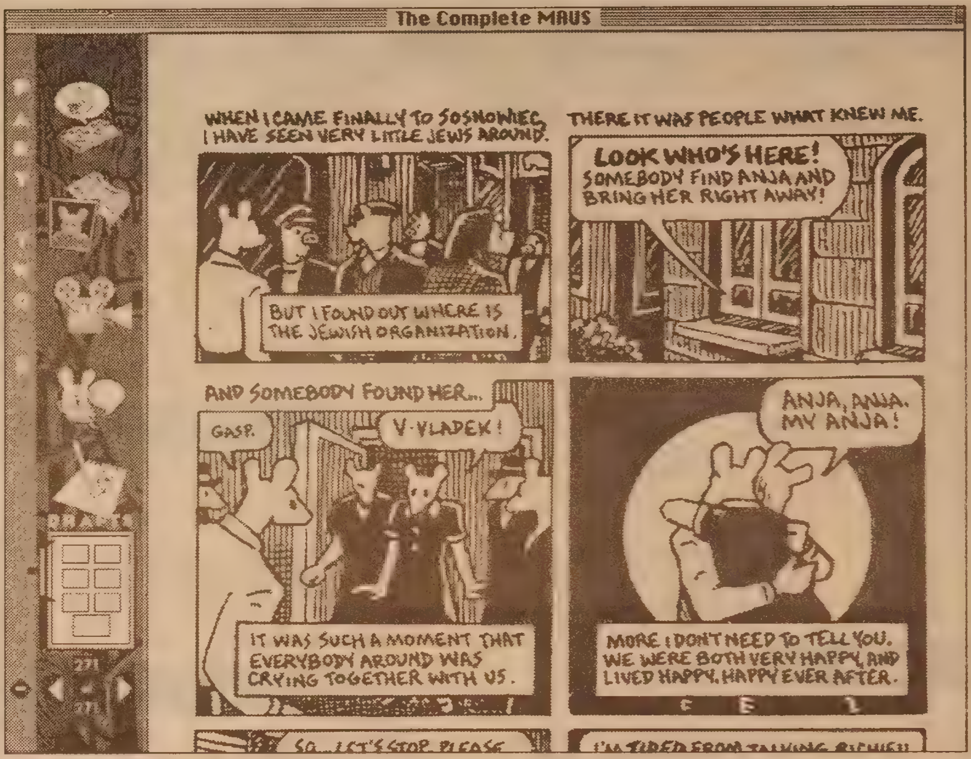
The Complete Maus

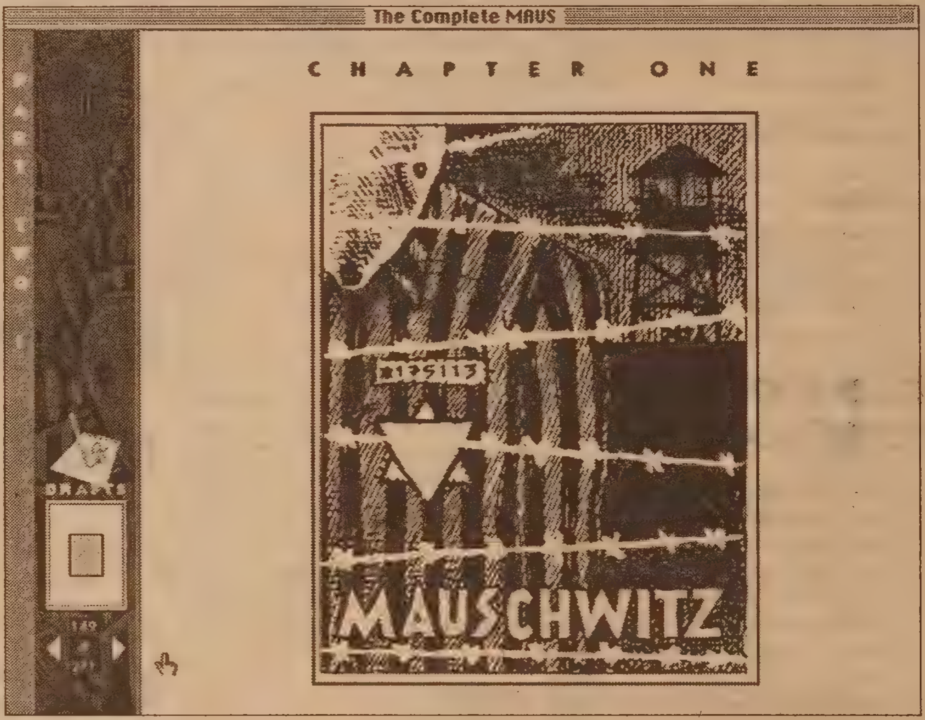

The Complete MAUS
WHEN I CAME FINALLY TO SOSNOWIEC, I HAVE SEEN VERY LITTLE JEWS AROUND.
BUT I FOUND OUT WHERE IS THE JEWISH ORGANIZATION.
THERE IT WAS PEOPLE WHAT KNEW ME.
LOOK WHO'S HERE! SOMEBODY FIND ANJA AND BRING HER RIGHT AWAY!
AND SOMEBODY FOUND HER...
GASP.
V-VLADEK!
IT WAS SUCH A MOMENT THAT EVERYBODY AROUND WAS CRYING TOGETHER WITH US.
ANJA, ANJA. MY ANJA!
MORE I DON'T NEED TO TELL YOU. WE WERE BOTH VERY HAPPY, AND LIVED HAPPY, HAPPY EVER AFTER.
271

Written By: Art Spiegelman
Published By: Voyager
For: Macintosh with 25MHz 68030 processor or better, System 7, 13" color monitor, CD-ROM drive (double-speed recommended)
List Price: $49.95
Reviewed By: Michael Robin

Maus: A Survivor's Tale, Volumes 1 & 2, by Art Spiegelman, tells in comic book format the story of Art's father's, Vladek Spiegelman, experiences during the Holocaust. When it was completed in 1991, after more than thirteen years in the making, *Maus* shattered the conventional concept of the comic book, later receiving a special Pulitzer Prize. It has since been translated into more than half a dozen languages and is used in high schools and colleges in History, English, and Art courses.

To help set the stage for telling this story in comic format, where the Jews drawn as mice and the German non-Jews as cats, both volumes open with a quote. The first is by Hitler: "The Jews are undoubtedly a race, but they are not human." For the second book, Spiegelman reprints an excerpt from a German newspaper article in the mid-1930s critical of Mickey Mouse, ending with the quote: "Down with Mickey Mouse! Wear the Swastika Cross!"

The Complete Maus CD-ROM highlights the capabilities and frustrations of this medium. The breath and depth of information presented here enhances the original book format. It incorporates on a single disk the entire contents of books, plus two hours of the original audio interviews between Art and Vladek Spiegelman, a transcript of their recorded interviews, historical documents, family photos and video clips, and magazine articles and commentary by and about Spiegelman.


The Complete MAUS
CHAPTER ONE
MAUSCHWITZ
149

The main frustration in this CD-ROM is that unless you have a 19" monitor you cannot see a legible full-size page from the book. The standard 14" monitor displays only about half a page at a time, forcing you to scroll down the page. While this does not cause a problem when you are reading plain text documents, as Spiegelman has points out, each book page was designed to work as a standalone image. (Even with a large monitor reading a book on a computer can feel awkward at times.)

In *The Complete Maus*, Voyager has succeeded in making the transition from traditional book format to digital media and presenting high quality, rich content on CD-ROM. If you've read Maus in its original ink-on-paper, having it available on your computer will be a great addition to your learning library. The breadth of supplementary information provided here will keep you returning again and again, learning more each time. (Voyager, 578 Broadway, Suite 406, New York, NY 10012. 212/431-5199. Email: VOYAGER@Applelink.apple.com) ■

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HSC Software, famous for Kai's Power Tools, is about to make life significantly easier for the digital artist with the release this June of Live Picture for the Macintosh. Live Picture has the ability to process huge photographic-quality images in real time, as if they were a fraction of their actual size. Furthermore, Live Picture allows the user to go back and modify any image processing operations in non-linear fashion.

I got an in-depth guided tour from Lee Varis of Varis Photography, who has been working with pre-release versions of Live Picture. (Varis, incidentally, photographed the moth used in Silence of the Lambs promos.)

FILE FORMATS

Varis explained that an 8 x 10 transparency generally requires a file 35 to 75MB in size. About 400 to 600 dpi (dot-per-inch) is desired with a 4,000 x 5,000 pixel image being ideal.

Before an image can be used in Live Picture, it must be converted into a proprietary file format called IVUE. The conversion process takes about two seconds for every megabyte, resulting in an IVUE file about one-third bigger than the original file.

To demonstrate the program's capabilities, Varis selected an 18MB image already in the IVUE format from a PhotoCD. When the file loaded up in a matter of seconds, I knew I was in for something special. "Live Picture is constantly rastering whatever you're working on to the screen, but it only does what you need to see. It never really opens up the whole entire file, it's only showing you 72dpi of what you want to see," explained Varis.

All subsequent editing and image processing information is stored as mathematical expressions in a separate FITS (Functional Interpolating Transformation System) file. The FITS technology is a new method for mathematically describing computer images—entirely different from traditional bitmapped methods. Saving work-in-process only requires saving the relatively small FITS file—Live Picture doesn't penalize you for frequently saving your work as you go.

IMAGE CAPABILITIES

Internally, Live Picture tracks colors at 48 bits (16 bits per color channel). That's 281.5 trillion different colors, allowing very subtle shading and precluding the color banding that can occur after applying multiple processing operations using only 24 bits.

BY DOUGLAS J. NAKAKIHARA

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The program also uses both RGB and HSV color palettes. For high-quality color separations, RGB images can be translated to and from CMYK.

Live Picture's lens-like "layer" features are equally impressive. In a telescope, a series of lenses is used to make objects appear closer than they really are. If we rearrange the lenses in reverse order, we would achieve the opposite effect—the object would appear farther. Alternatively, we could regrind a lens to change its optical characteristics, add another lens that was identical to an existing one, remove a lens, add a different lens, or do any combination. Every set of lenses would interact with each other and produce a different image through our telescope.

In the same manner, Live Picture's image processing operations are all done on separate layers. Each time a user selects a new processing function, a new layer is created. As with our hypothetical telescope, you look at the original image through the layers, which collectively form the final image. There is no limit to the number of layers that can be used.

Also, as with the lenses in our telescope, you can modify a layer, change the ordering of layers, duplicate an existing layer, remove (or hide) a layer, and add layers. The ability to hide layers allows a user to explore multiple versions of a project without needing to save multiple files. User-definable layer names are displayed in a vertically scrolling list on the right side of the display. The ordering of layers can be quickly changed using a drag-and-drop technique. The list also provides a means to group layers.

This is a quantum leap from traditional undo and redo capabilities. You can go back and tweak any operation that was performed without having to start all over. Varis explained that before Live Picture, he would work with a low-resolution version of a project until the client's final OK. He then had to start from scratch and recreate a high-res version. This is now totally unnecessary.

Each new layer lengthens the display update time. If this becomes a real burden, you can compile all of the layers into a new IVUE file. This lets you start anew and continue to add layers. However, you lose the ability to modify the layers existing before the compilation.

Instead of floating toolboxes, Live Picture's tools are stacked vertically on the left side of the screen. Varis says he likes this arrangement because toolboxes inevitably get in the way and have to be moved around.

There are two sets of tools: creative and mechanical. Creative tools allow users to work with brushes, marquees, and bezier path tools. Paths are used for masks, stencils, and inputting text. PostScript and TrueType fonts are supported and brought in as fully-editable bezier outlines. You can change the brush size and density, and apply a pastel or water color effect. The mechanical tools are used to scale, rotate, skew, and flip things around.

Image-processing capabilities include airbrushing, cloning, painting, coloring, image insertion, distortion, silhouette, image cloning, blurring, sharpening, lighting, and color correction. All masks have hard or feathered edge options.

Since all operations are mathematically stored, some effects can be proportionally undone. If, for example, a certain part of an image was blurred, the user can undo the blur at an intermediate point, without reversing the entire process.

WORKING WITH LIVE PICTURE

Varis first colored the initial image and gave it a gradient look. Pop-up slider gadgets provided any easy way to set the desired beginning and ending values. Once the parameters were set, the operation took only a few seconds. He also showed me how quick the rotation and resizing operations were.

He then loaded a 50MB 6,000 pixel 2-1/4" shot, also originally from a PhotoCD. He resized the image to fit inside the initial image and pasted it in, using a 100-to-zero percent gradient, bottom to top. The gradient represents one of the two alpha channels available for every layer, called a mask.

The other alpha channel is called a stencil and created using bezier editing tools, similar to Illustrator, to make a path that defines a "cookie cutter" mask. Varis created one to cut out the main part of the second image. The hard-edge cutout had very nice antialiasing, allowing a good composite image.

Varis then retrieved the bezier path from the stencil and used it for a stencil in a new layer. He used this to create a soft gradient drop-shadow with a feathered edge. Placing this beneath the second image gave the piece a

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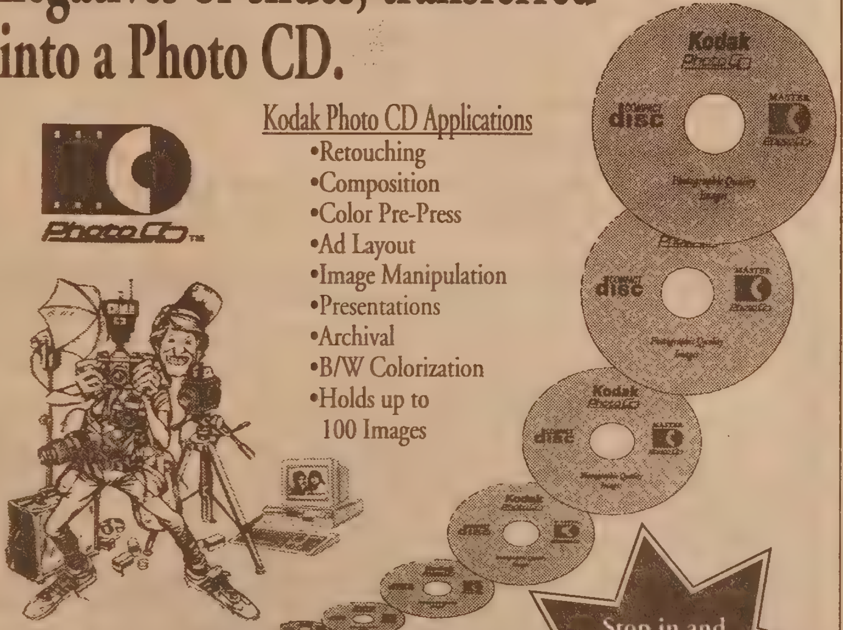

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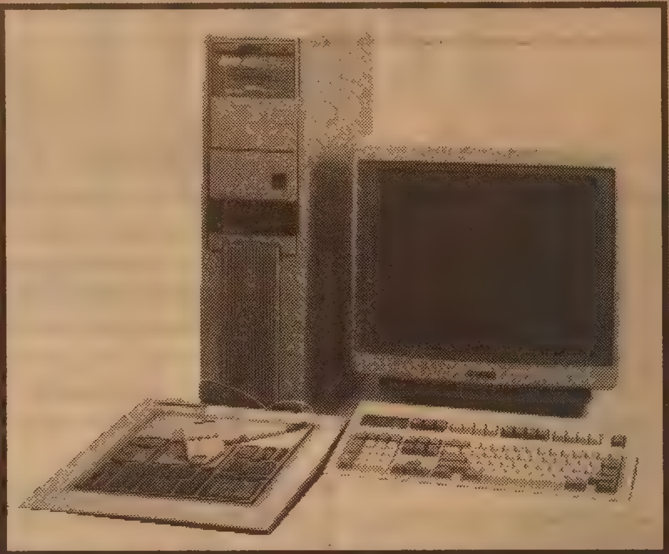

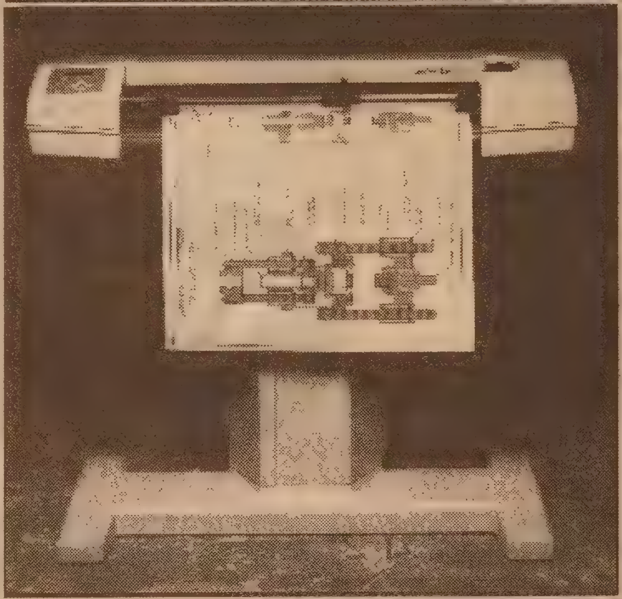

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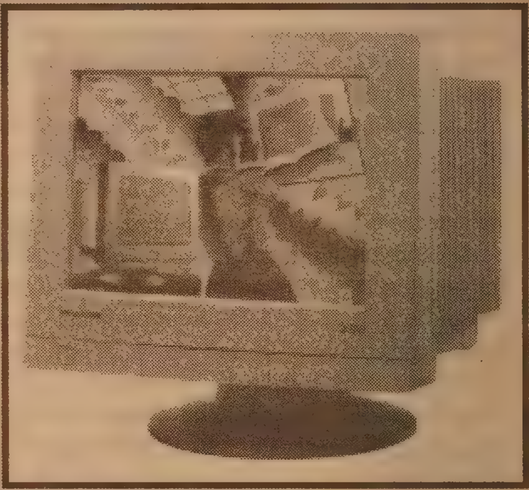

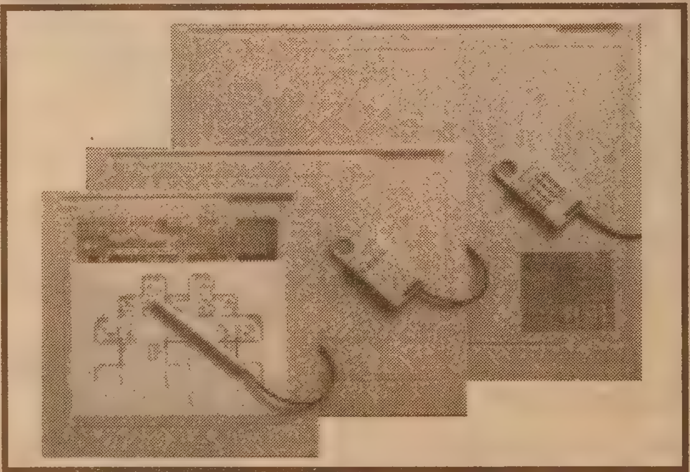

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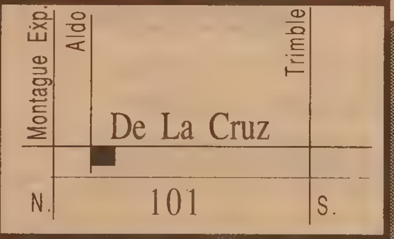

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three-dimensional feel.

Live Picture's silhouette feature was demonstrated by bringing in a picture of a rose, shot over a blue screen. By rubbing the mouse pointer over the rose, you define the general object you want to cut out. Live Picture automatically calculates a mask based on color and contrast values. A handy preview function lets you make sure you got everything right. The actual calculation of the mask is not instantaneous, however.

Of course you could use Photoshop to accomplish these effects, but it would take you a significantly longer time. Live Picture performed all of the operations so smoothly, it was easy to overlook the magnitude of what it was doing. However, when you consider that all of the operations were being performed on very large files with 48-bit accuracy, the results are nothing short of awesome!

When you zoom in on a display, everything is recalculated to show what it would look like at the new magnification. Unlike in a traditional paint program, you don't really get pixelization because Live Picture keeps recalculating the display.

Another unique feature of Live Picture: airbrushes are mathematically calculated and retain their size relative to the physical display. Thus, when you change the display magnification, an airbrush increases in size relative to the image. This allows you to work with, say, a 3,000-pixel airbrush—in real time.

OUTPUT

Once all of the image processing operations are complete, the IVUE file is married to the FITS file, forming the final bitmapped output file. The output file can use any resolution regardless of the resolution of the original image. The compiling process is reportedly not simply a playback of all of the image processing operations. Thus, Live Picture avoids cumulative processing errors by only processing the information in the FITS file that is implied overall. Depending on the complexity of the project, this process can take an hour or longer.

Live Picture uses sizable windows, called views, that define what areas of the overall montage the user wants "clipped" to the final file. Views also provide a quick way to navigate around the screen.

Live Picture also supports TIFF, EPS/DCS, Photoshop 2.5, and Scitex CT file formats. The release version will support all of the acquire and export Photoshop plug-ins, as well as Mac codec hardware, according to Varis.

For remote site processing, there is a unique benefit to this multiple-file approach. A user can work on a JPEGged IVUE image and create a FITS file. The small FITS file can then be transferred via modem to, say, a service bureau that has the original uncompressed IVUE image for final output.

USE THE RIGHT TOOLS

Pixel-based image processing still makes sense for certain operations, like making very detailed changes. Live Picture's forte is performing larger-scale operations. For example, to fix wrinkles under someone's eyes, Varis would use Photoshop. "Using Live Picture would be like using a giant hammer and trying to hit a little finishing nail," he says. "It's not really suited for that." Live Picture is expected to serve as an addition to a digital artist's arsenal of tools, not a replacement.

REQUIREMENTS

The program requires at least a 68040-based Macintosh with a 24-bit graphics card, color monitor, and 32MB of RAM. The recommended system configuration is a Macintosh Quadra (or PowerMac), 64MB RAM, 24-bit graphics card with hardware zoom, a large screen color monitor, a pressure-sensitive drawing tablet, and a QuickTime/JPEG acceleration card. A PowerMac version is scheduled to be released sometime after the regular version ships. The program uses an ADB-chain dongle.

Live Picture is nothing short of revolutionary, and represents an opportunity for smaller digital-imaging businesses to compete with larger companies. As Varis says, "Live Picture will put the fear of God into a lot of places with these expensive pieces of equipment."■

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Growl

Jaundiced Reflections On Multimedia

GROWL

I saw the best minds of my generation destroyed by multimedia madness, hysterical, frantic,
dragging themselves onto the superhighway at dawn looking fo a digital fix,
starryeyed hipsters seeking the future electronic connection with the planetary soul in the machinery of bytes,
who venture capitaled, IPOed and bootstrapped sat up scheming in the analogue darkness of garages, office parks and lofts floating visions of the emerging hive mind,
who bared their brains to Heaven under the Sell and saw Molochian signals flashing on fluorescent screens illuminated,
who passed through universities with fevered sighs hallucinating Hollywood and virtual reality amongst the business majors,
who were sucked into the social hysteria for crazy & unpublished ordeals of new media on the inside of the skull,
who filled the world with infotrash, burning up the wires with strategic alliances and vapourware of Error that wouldn't call,
who got flustered with vast herds of lemming stampedes through the Gulch with silicon for New York,
who firey interacted in tiny CD-ROM shacks or broadcast in Product Alley, repurposed their content night after night

...and so on and so on—with apologies and thanks to Allen Ginsberg.

Ginsberg, incidentally and interestingly, had a fairly clear (although not technically correct) vision of one aspect of the Internet in his 1961 poem, "Television Was a Baby Crawling Toward That Deathchamber":

> **Six thousand movietheaters, 100,000,000 television sets, a billion radios, wires and wireless crisscrossing hemispheres, semaphore lights and morse, all telephones ringing at once connect every mind by its ears to one vast consciousness This Time Apocalypse—everybody waiting for one mind to break thru—**

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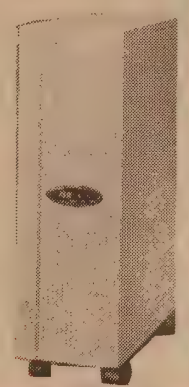

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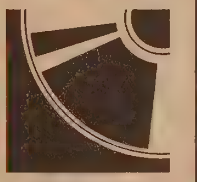

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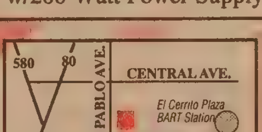

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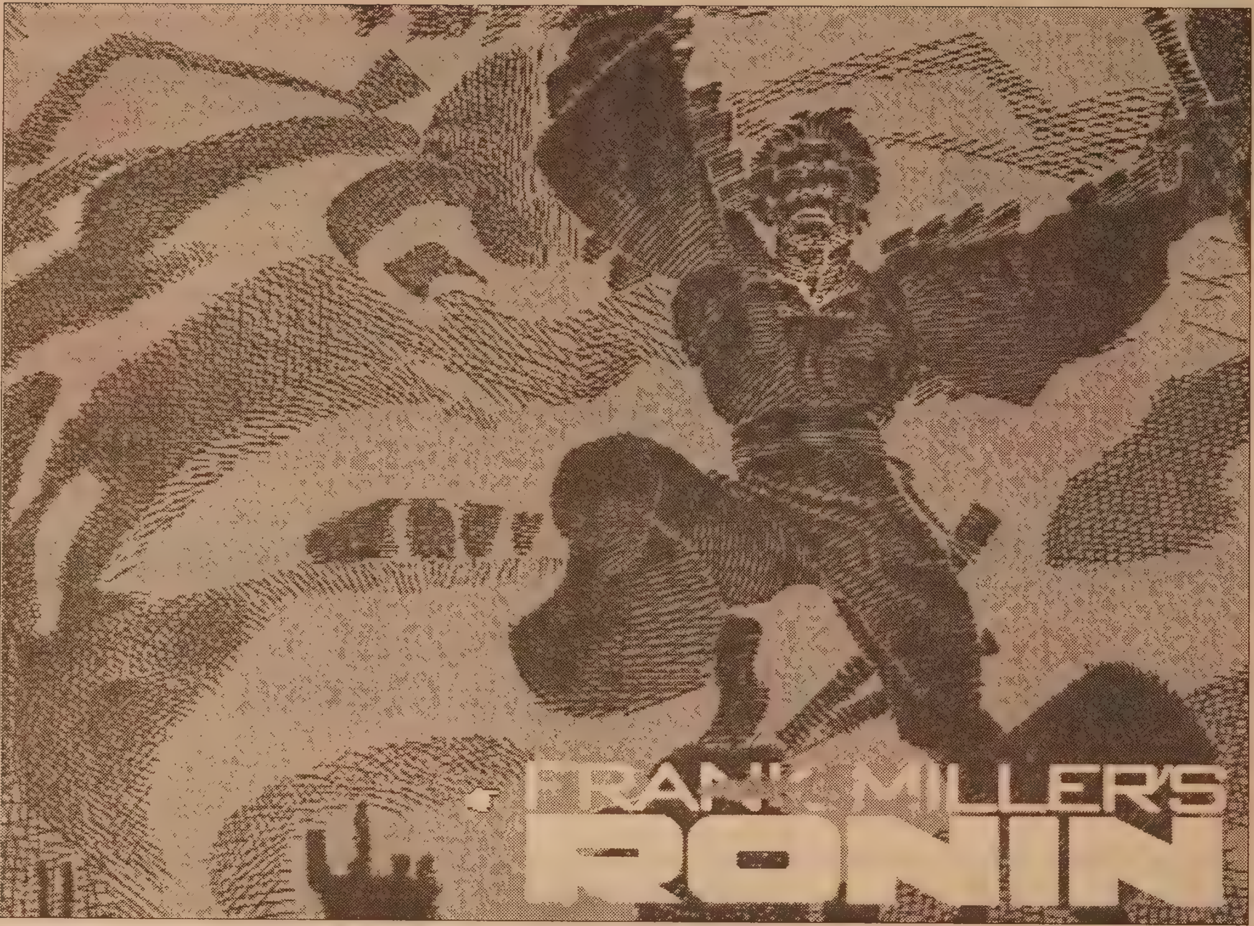

MULTIMEDIA: REALITY CHECK

The mood of "Growl" came upon me early one morning when I heard one media person too many talk about "getting into multimedia." Once again, I was struck by the realization that multimedia is such a big elephant that all the big-game hunters desperately want to bag it for their trophy rooms while the proverbial three blind men still can't fully describe it.

I wouldn't wish to go back to the days when information was truly scarce—what one saw with one's own eyes or heard about from itinerant troubadours. However, the grand attractor forces of interactive multimedia and its purported riches act as hypnotic distractions on many who frankly should just get on with what they're doing instead of chasing will-o'-the-wisps across the marshes.

True, this stance leaves one liable to accusations of "lack of vision." However, visions can be hallucinations and there is a definite mood in the air of not wanting to miss the bus even if it is imaginary.

TRADITIONAL MEDIA WORK JUST FINE

Many contemporary forms of media work reasonably well (which is not to say that there is no room for improvement).

Broadcasting, especially radio, works within the limitations of transmitting signals through the ether. It is most definitely audio-only, and people tend to listen to it as background while doing something else. One could argue endlessly about the content, but the basic mode of near-instantaneous communication with large numbers of listeners is inherently one-to-many.

Radio does, in fact, have some interactive aspects. What else is talk radio? The interactivity is limited and almost entirely controlled by the broadcaster, but there is a feedback loop. Clearly, however, there are major theoretical and technical problems in the medium that prohibit many-to-many feedback. While there may be modifications of broadcast operations, a full-scale rush towards wholesale reform would be akin to tilting at windmills.

CRASH!
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GURGLE
SLUP
SLICE
POP
LEMON DROPS
MUNCH MUNCH
MUNCH MUNCH
GOBBLE GOBBLE SCHMACK
DRIBBLE DROOL SLOBBER
GORGE GLUB SHOVE
STUFF SMEK SNORT
SLURP CHOMP SNUK
Belch.

Similar arguments can be made about other current media. New media will not replace present forms, but will supplement them. Just as the industrial revolution did not make agriculture unnecessary, newspapers, magazines, books, music, theater, films, radio, and television will continue to have their places in society. Multimedia certainly offers new possibilities for distribution of these forms, as well as its own as-yet-unknown new paradigms. The ones that survive this initial phase of over-hyped excitement will be the ones that offer genuine advantages to the consumer.

Clearly, the market share of traditional media is certain to shrink as new media enter the arena. Even if the total media market expands significantly, traditional media revenues are most unlikely to grow at the rate of new media revenues. Hence the gold-rush mentality we are witnessing. It's a simple matter of attempting to maximize return on investment. Adding an extra spin to the mix is the great confusion over what the word multimedia means.

MULTI-MEANING MULTIMEDIA

Does "multimedia" refer to the use of desktop-production tools in the creation of conventionally distributed media? Does it mean computer products with sound and video? Is its real meaning the use of content in multiple market channels, such as movies that are also the basis for games and "Special Commemorative" soft-drink containers? Are magazines that sponsor online services and

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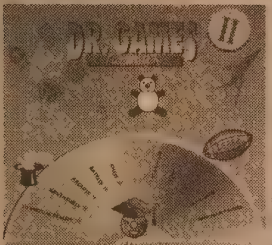

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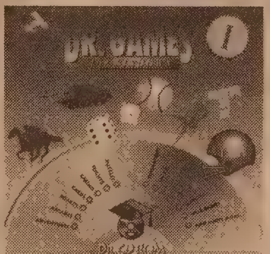

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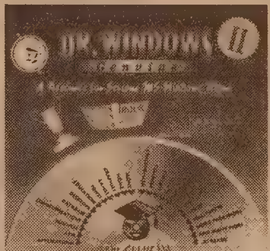

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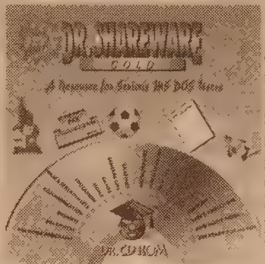

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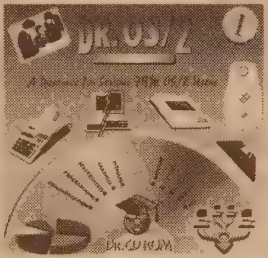

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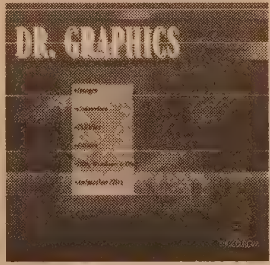

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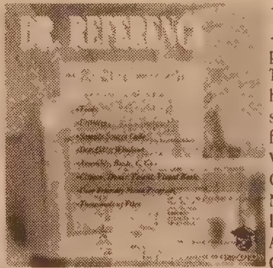

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Dr. CD-ROMs are published by Accurate Research, Inc. at 1500 Wyatt Dr. #10, Santa Clara, CA. 95054, USA. TEL:408-748-9988 FAX:408-748-9989 put out CD-ROMs multimedia? Can radio and TV stations be multimedia? What about virtual reality—is that multimedia? Are new forms of electronic distribution and networking multimedia?

The correct answer is all of the above.

The multiple definitions obscure and tantalize as much as they illuminate. They're partially responsible for stirring up such hype—when the same word is used in mass media to describe so many different things without full explanation, both the public and members of the media begin to believe that it actually is all the same thing.

The most important emerging feature of multimedia, at this time, seems to be that it will be a networked many-to-many process rather than a broadcast product. Associated with this is the belief that a large hobbyist population of enthusiasts will evolve for whom multimedia will be rather like playing in a garage band. They'll do it for fun, perhaps with the hope of turning pro—but it will be a way of spending time and expressing creativity, rather than a matter of consuming someone else's ideas in the form of content.

There will be a myriad of niche markets for content, but multimedia seems unlikely to become mass media. The question for publishers will be how to fit their expensive titles into these smaller-than-hoped-for markets. A longer-range vision, however, might foresee a time when this legion of hobbyists finds ways to make truly involving multimedia that will expand the market for titles.

Regardless of what the future may hold, titles are here and now. There's even rumored to be a deluge of CD-ROM titles on with estimates ranging as high as 100 releases a week, although I seriously doubt that figure.

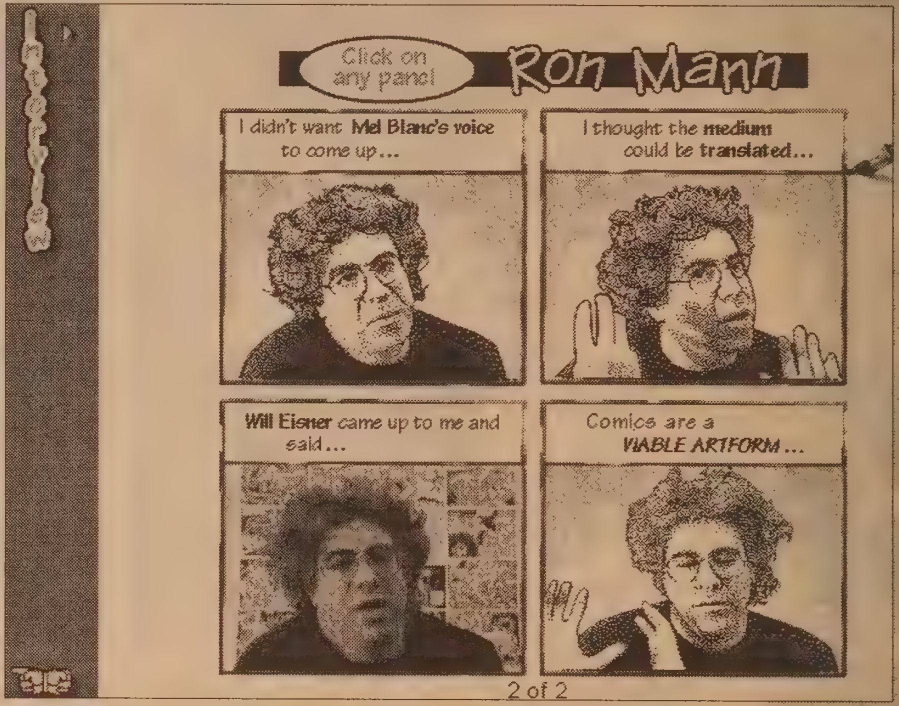
BLAM!

BLAM! is a CD-ROM-based magazine that exhibits a remarkably simple but effective approach to producing an experience unobtainable from traditional media. It's not a pleasant experience—but it's an experience nonetheless.

The technique is simple. Use a HyperCard front end with lots of flashing; use bold black-and-white graphics, many in what a substantial portion of the population would consider bad taste; use harsh and abrasive sounds that repetitiously grate on the nerves; keep interactivity to a minimum but functional. The subject matter for the most part is well suited to this treatment, being art-damaged and sex-obsessed from the Manhattan alternative world, although there are excerpts from Howard Rheingold's The Virtual Community and 2600, The Hacker Quarterly. Many screens contain only one word in huge, jagged type; the illustrations are equally severe—some are called up with a mouse click and some are thrust in your face.

The interactivity is basic. You can select an article to look at (although you are actually reading, it's more like you're looking at words). Once in an article, clicking on the right of the screen will take you to the next screen, clicking on the left will take you back a screen, and clicking in the middle will take you to the article's "splash" card or the table of contents. When you first open BLAM!, there's a mock piece of interactivity asking you various personal questions, which will then randomly select articles or advertisements for you. This can be overridden by simply saying that you've seen BLAM! before.

It's all rather jokey and the subject matter is not to my taste but I enjoyed BLAM! for its boldness and spunky, totally in-your-face attitude.


Click on any panel
Ron Mann
I didn't want Mel Blanc's voice to come up...
I thought the medium could be translated...
Will Eisner came up to me and said...
Comics are a VIABLE ARTFORM...
2 of 2

COMIC BOOK CONFIDENTIAL

Comic Book Confidential is a pretty good example of an interactive movie with ancillary materials. Based on a documentary by Ron Mann, it's interactive in the sense of immediate access to selected segments, not in the sense of a branching plot line or multiple character point-of-views.

You can watch the entire 90-minute movie straight through in either of two screen sizes, with standard QuickTime controls to pause, etc. You can also access any artist interview from an index, or go straight to several "Filmographs," which are basically short stories told through a comic strip with added sound and camera movement. As well as the original movie, there are still collections of the artists' work, their biographies and publishing histories, an interview with Ron Mann, suggested further reading, and a copy of the Comics Code.

A major reason this title works is that the original documentary is good. I don't have much interest in comics, but it was interesting to me to hear the artists talk about their work.

Comic Book Confidential has some problems with the search mechanism. It only finds the next occurrence of the desired work from the original dialog box. To find subsequent occurrences, you must use a keyboard command—you can't even just keep hitting return. In addition, the search only works for text, it doesn't cue the movie to an appropriate point. Likewise, if you're looking at the still collection of art or the artist's biography, you must go back to the index to cue the movie rather than being able to play it from that screen.

All this is minor compared to the major offensive thing I found: In the biographies on the disc, the text runs into the illustrations, making it illegible; on the box, the art is cleaned up so that the text flows correctly. In addition, the bottom half of many of the last lines of text on a screen are cut off. This reeks of sloppy production, and, in the case of the first problem, they obviously knew about it and couldn't be bothered to fix it. Otherwise, *Comic Book Confidential* is satisfactory.

DENNIS MILLER — THAT'S NEWS TO ME

You'd have to be a total Dennis Miller fanatic to get anything out of this CD-ROM. Miller cracks jokes in his *Saturday Night Live* style about events from 1993 that you've probably already forgotten about. His delivery is frequently off, and the editing is poor. So you can select one joke at a time by selecting the month, the general category, and then the topic. And then you can repeat the process. So what?

This product proves that there are some things that should never be interactive. ■

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Gulch Gossip

■ by Jonathan E. ■

■

Nancie S. Martin of **Jouissance Productions**, formerly with **Brilliant Media** of **Peter Gabriel XPLORA 1** fame, has begun work on two new CD-ROMs, one a history of the soul music of **Atlantic Records**, the other on various '60s rock artists. The finished products will have both Red Book audio and be Mac and MPC compatible. They'll be released through **Rhino** and **Comptons**. ... **Jonathan Nelson**, sound-sculptor for the **Raster Masters** and producer of live events with **Terence McKenna** and **Rose•X Video**, **Psychic TV**, and **Funkadelic**, is hard at work on **Organic Online**, his new online service. It will be a "virtual venue" where the public can check out—for free—what's going on in music, book publishing, and, soon, other artistic areas. The first labels supplying material are San Francisco's **City of Tribes** and **ZoëMagik**, while the first author represented is **Howard Rheingold** with a chapter of *The Virtual Community* and pictures of his daughter, **Mamie**. The service will offer Mosaic access with genuine multimedia capabilities of text, graphics, sound samples, and eventually video as well as simpler gopher service for text or an automated email service. Negotiations are ongoing with more content providers, and the service will debut in early June. For further info, email Nelson at organic@cyberorganic.com or watch this space for full access information next month.

■

Along with the **Wadsworth Publishing** deal mentioned in the last column, the **San Francisco State University Downtown Center** got $100,000 in seed money to fund a new **Interactivity Research Lab.** The Lab will work in association with the **Social Response to Communications Technology** group of **Stanford** to identify the social, artistic, and business issues raised by interactivity. The idea is for this not to be a strictly academic endeavor. **Beth Rogozinski** expressed it as "We're going to try to steer the industry in the way that is least offensive." For details on how to submit a research proposal, contact Rogozinski at (415)904-7741.

■

Faithful readers will undoubtedly be interested to know that the name of the new **Ziff-Davis** magazine stirring up so much comment in the last two columns is ***Computer Life***. It's set for an October launch. To blow my own horn for a moment, I'll be contributing material (**Mike Edelhart** wasn't interested in giving me a hard time about the "*Wired* for dummies" line; in fact he seemed rather amused by it); and to blow it again (no, I don't mean that way—at least I hope not), I have a story on the **Raster Masters** in the June issue of *Wired.* Check it out and check them out (maybe in July at the Fillmore—details are not finalized as we go to press). Without doubt, the Rasters are the Masters of improvised live computer-generated video graphics.

■

You have a few days left to catch the **Cyberhead...Am I Really Existing** installation by **Patrice Caire** at the **Center for the Arts Gallery in Yerba Buena Gardens**, 701 Mission St., SF. Didn't you always want to crawl around inside an artist's head through the miracle of virtual reality? You probably wouldn't want to do that in boring old slimy physical reality, would you? The show closes on June 12.

■

Morph's Outpost on the Digital Frontier presents a giant United Developer's Summit, "Art Teco," at Fort Mason on June 16, 17, and 18. There will be the usual panels and seminars on all sorts of multimedia concerns, but one big difference is that this is "the first conference put on by developers for developers." Probably most fun will be the **Spoonman Showcase Salon**, a special version of the infamous **Cobra Lounge**, featuring the first annual Morph's "Golden Lobes" Awards hosted by the inimitable and redoubtable **Mark Petrakis**, he of the mighty spoons, and **Cobra Woman** aka **Cintra Wilson**. The Cobra Lounge will be open to the public on June 18 and 19, with a passel of local media performers and artists attempting to "bridge whatever gaps might still be thought to exist between art and technology." Tickets may be had from City Box Office at (415)391-4400 or by stopping by BASS (if you can't resist those hefty service charges). Further info on the Cobra Lounge by email from cobra-info@cyberwerks.com . Info on the Developer's Summit from 1-800-Go-Morph or info@morph.com .

■

Neatly slotted into this schedule is the **Computers & Humanity Cyber Circus** at Glide Memorial Church, 330 Ellis, SF, on June 17. It's a fund-raiser for **Computers and You**, a program and center founded by **Cecil Williams** and **David Bunnell** in 1989 to make computer access and training available to homeless and low-income people so that they can get ahead in life. There'll be live music, interactive stuff to try out, gourmet food, and circus ambiance provided by the **New Pickle Family Circus**, as well as stories of success by the program's graduates, so support this worthy cause by calling (415)715-6204 for your tickets.

■

The **BodySynth** is something that I think could create a major new form of cultural expression. In short, it's an outfit that converts your body movement into MIDI signals so you control sound, lights, and

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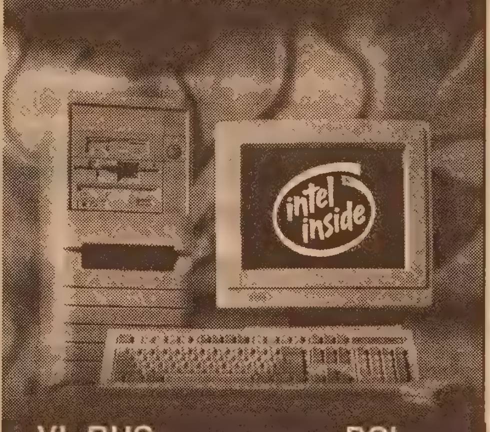

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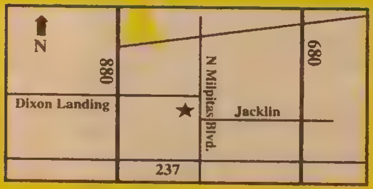

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any other device that is MIDI controllable. It's like playing air-guitar, but not dorky. See and hear for yourself when **The CyberBeat Brothers** of **Chris Van Raalte** and **John Zane-Cheong** perform at the Glide Cyber Circus. They'll also be at the **Science in Arts: Arts in Science** symposium of the **American Association for the Advancement of Sciences at San Francisco State** around 4 pm on June 21. The BodySynth was featured at the **WOMAD Festival** last year, at the **Tokyo Macworld Expo** in February, and has traveled to Texas three times in the past few months. To find out more or get one for yourself, contact **Ed Severinghaus** via email at ed.s@sfnet.com or call him at (415)387-1142.

■

For you video heads that want the real low-down on digital video editing, the **Bay Area Video Coalition** (BAVC) is hosting a **Desktop Video Showdown** on June 25th, from 10 am to 3 pm at the **Pacific Bell Multimedia Theatre**, located on the corner of 3rd and Harrison in San Francisco. Four of the most popular desktop editing systems for video, Avid Media Composer, Adobe Premiere with Radius Video Vision, ImMIX Cube, and D/Vision by TouchVision, will be compared and contrasted in a no-holds-barred seminar. Each system will be explained by a professional video editor who works with that system regularly, challenging the performance of the system and giving practical advice on its capabilities. Interface designs, rendering times, special effects and transitions, resolution qualities, EDL, and time-code options will be discussed. The editors will critique each other's work—now, that's a showdown!—and talk about the viability of these systems for today and for the future. Call BAVC at (415)861-3282 to register.BAVC recently received a $125,000 challenge grant from the NEA to create digital techniques for archival preservation of historical tapes. Ironically the first step is to transfer them from one analog medium to another, which BAVC has recently done with the tapes of the Gay and Lesbian Center of the San Francisco Public Library. Contact **Anne Etheridge** at the above number or via email at *videonet@aol.com* for further details.

■

Finally, what's multimedia without sound? The **Interactive Sound Studio** at the **Exploratorium** has a massive number of workshops and demonstrations of unusual, interesting, and fun ways to use and approach sound from morphing musical forms to what the Grand Canyon or the Bay Area sound like. Software and unusual compositional techniques are included. The program runs until September and info may be had from (415)563-7337. ■

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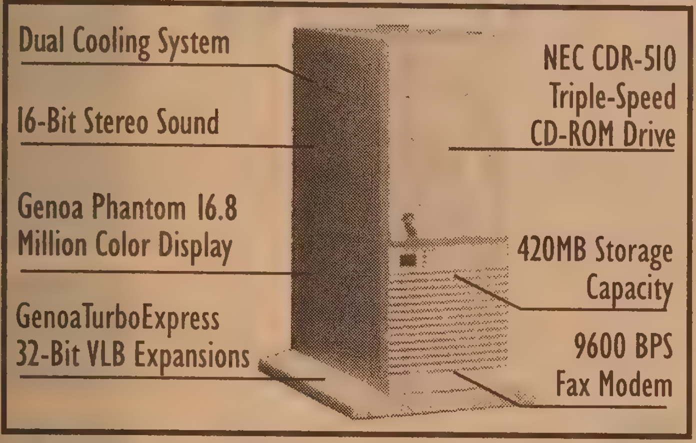
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Amiga Multimedia

Do-It-Yourself Demos

While attending a trade show produced by my employer, I noticed that a booth run by one of our subsidiaries wasn't drawing much interest from the hundreds of attendees, in spite of the fact that their service was of considerable interest.

They needed to inform attendees about the service without scaring them away.

A short but catchy video presentation would surely do the trick. No one would feel imposed upon by a salesman. Passersby wouldn't have to read a brochure—they'd just stand back and watch TV.

Since I often write about how easy and inexpensive it would be to do a great multimedia presentation using the Amiga, this was the challenge to make me put my money where my mouth was.

This article describes how I went about creating a demo presentation, including selection and use of hardware and software, with a particular emphasis on Scala Multimedia 300.

HARDWARE

Choosing the Amiga 1200 as the delivery hardware was easy—the photo-realistic color and animation capabilities of the AGA chip set were a necessity. Furthermore, the 1200's built-in RF and composite video outputs allow it to be directly connected to any standard TV.

Portability was also an issue. Though the 1200 cannot be labeled a true portable computer because it requires AC power and doesn't have a built-in screen, its compact size and built-in keyboard make it very transportable.

A comparable IBM PC-compatible system would require a fast 486 processor, an accelerated video card, a sound board, and a video converter (needed to change a PC display signal to standard NTSC video; a good one costs several hundred dollars). This higher-priced setup would have delivered lesser performance, not even considering the aspect of portability. An Amiga 1200 with a 2.5-inch 60MB hard drive and 6MB of RAM has a street price of under $1,000.

BY DOUGLAS J. NAKAKIHARA

SOFTWARE

For high-impact performance, the only choice for presentation software is Scala Multimedia 300. Scala takes full advantage of the Amiga's graphics and audio capabilities, and really shines on an AGA machine. Scala carries a price tag of about $400, bringing our total package to $1,400.

Now remember that this is basically a delivery-only system. Although you could develop the presentation using the same configuration, you would want to add a paint package, an image processor, and maybe a 3D animation package to add some spark to presentations. A good paint program will run you about $150 and an image processor about the same; 3D animation programs cost from $250 on up. Though not a necessity, a scanner or video framegrabber can add even more pizazz to a presentation, by allowing you to quickly incorporate pictures.

MY SETUP

I have an Amiga 4000, 3000 and CDTV networked with Spectronic's AmigaLink. My 4000's hard drive is filled with—what else—VideoToaster software, so I run Scala on the 4000, but the software is actually stored on my 3000's hard drive. Only Scala's fonts are stored on the 4000. The network allows me to perform CPU intensive tasks like modifying graphics and audio on the 3000 at full speed, while testing presentations on the 4000.

I digitized some photographs for the presentation using MacroSystemUS's VLab, though I could have also used my VideoToaster. I then cropped and scaled the images using Art Department Pro (ADPro) from ASDG. For smooth transitions during presentations, it is important to keep the resolutions of all screens the same. The correct resolution was easily determined by simply loading one of the Scala backgrounds into ADPro and noting its size.

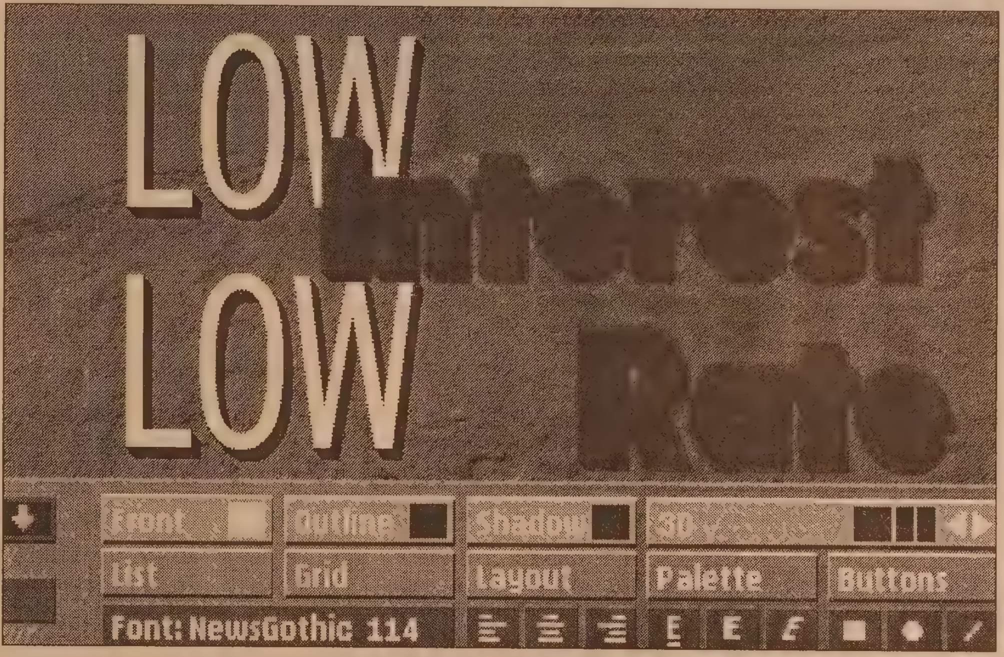
I needed to create a screen where a user could input numbers on an imaginary adding machine and then do some calculations, the results of which would appear on subsequent screens. Unfortunately, Scala permits only a limited degree of user interactivity on a single screen.

I solved the problem by writing the calculation program using Helm from Eagle Tree Software, specialists in just such applications. By calling an ARexx script from Scala, I was able to seamlessly integrate the Helm application into the Scala presentation. (I could have used Innovatronics' CanDo instead of Helm. However, since CanDo displays an annoying startup screen unless you pay a license fee for a special player program, Helm's freely-distributable player was better suited for the task.)

FLYING LOGOS

From the very beginning I knew I needed some "eye candy" (i.e., a 3D animation). I wanted something spectacular, but I didn't want to spend a whole lot of time on it. Since the company's service involved the citrus industry, I settled for the company's name revolving around an orange.

Using the VideoToaster's Lightwave 3D animation package, I made a 90-frame animation. Setting up the animation was a snap. Lightwave had a pre-made ARexx script to set up the letters in a circle. The orange: a ball with the "orange" texture. I used a nice steel-gray background generated with JEK's ProFills.


LOW Interest
LOW Rate

Font: NewsGothic 114

At first I converted the Lightwave 24-bit image frames to HAM8 with ADPro and ProControl (also from ASDG), but the anim file ended up a couple megabytes in size. Although Scala has an option to spool animations from disk, super-smooth animations must be run from RAM. It was also questionable whether the 1200 could play it back at 30 frames per second—the resolution was 704 x 480. So I reduced the number of colors further to 256. The animation still weighed in at 1.5MB.

Then I realized that the company name appeared twice on the revolving ring and made one revolution—so I could just repeat the first 45 frames with no visual difference. This reduced the animation to under 1MB at last.

USING SCALA

Scala screens are called "pages" and are displayed in a vertical list. You can graphically arrange them any way you wish using the mouse. Pages are generally executed from top to bottom, but there are provisions to jump around in subroutine-like fashion. A typical page consists of a background image, with some text placed on it. However, pages can also indicate the start or end of a music module, an animation, an ARexx script, etc. Scala supports Tracker-type music modules, so using my networked CDTV, I pulled a nice song with a jazzy beat and catchy melody from a music module CD.

A page can be "wiped" onto the screen using any one of a number of built-in effects. You can also define how long a page is visible or whether it should be user-controlled. Scala also has a feature where it will record the timing of pages while you go through it once manually—a very handy feature if you want to synchronize events with music.

Although Scala includes many premade backgrounds, I wanted to use a custom-tailored one for the informational text portion of the presentation. I started with a beautiful close up of some fresh citrus fruit and then created a grayscale 16-color embossed version using ADPro. This was

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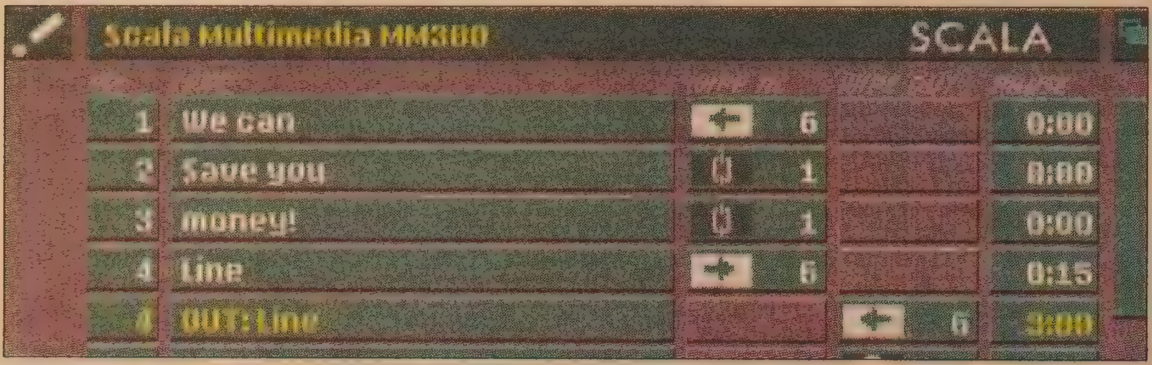
accomplished by first changing the color image to black-and-white, and then making it into a negative. This image was embossed, with the result saved as a 16-color hi-res IFF file.

Since Scala uses a special palette color order, I loaded one of the pre-made backgrounds into my paint program and modified the palette for a grayscale picture. The embossed picture was loaded and remapped to the modified palette. The final image was saved in the Scala backgrounds drawer. During the presentation, the full-color version fades into the embossed version—an interesting effect—which serves as a background for the subsequent informational text.



Adding text to a page is as easy as selecting the font and typing on the page. Every line of text is its own object; every aspect of the text can be modified, including alignment, color, outline, shadow, and 3D-look. Text can be moved by just dragging it on the screen with the mouse.

For optimum speed, I only used bitmapped fonts and not Compugraphic outline fonts. If you have to, you can convert Compugraphic fonts to bitmapped using the AmigaDOS Fountain program. However, Scala already comes with lots of nice large bitmapped fonts.

You can also import graphic brushes. However, if you make custom ones, make sure the brushes use the same palette (or a subset) as the background, otherwise results may be unpredictable. Scala ships with many pre-made two-color symbol brushes.

Wipes can also be applied individually to text and other objects on a page, with separate on and off wipes supported. An effect can be applied to a group of objects by chaining them together. The speed and timing of the effects are configurable as well.

One 256-color picture I used didn't have the right palette to acceptably display the mouse pointer. So I used the "optimize palette" feature. I then noticed that before this image would appear there was a long pause, which I determined must be caused by Scala remapping to the optimized palette. To eliminate this, I just saved the background from Scala, so the modified palette would become the default palette. (You also have the option of saving the entire page including Scala objects.)

Since I chose to use an unaccelerated 1200, I was limited as to the type of text and page wipes I could use. I shied away from effects that moved a lot of graphics around. Most of the wipes worked fine, but a few would be slightly jerky. (Incidentally, an accelerator would have only added about $200 to the system's purchase price.)

The completed project, including background and audio files, was copied to an A1200 by connecting it to the network (I disconnected the CDTV). The Scala project script is an editable ASCII file, so with a standard text editor, it was easy to replace certain path names with ones that would work on the A1200.

THE RESULTS

Everyone who saw the presentation, including the president of our company, was very impressed and couldn't believe the Amiga 1200 achieved the results it did.

MORE FROM SCALA

Scala has reportedly developed a system that uses a CD32 with MPEG module, networked to an Amiga 4000 using their serial ports. The CD32 becomes a player device for Scala MM running on the Amiga 4000. This innovation will minimize the cost to develop CD32 titles using MPEG, since it allows use of CD32's inexpensive MPEG hardware. Of course this only helps for decode/playback development.

Scala is currently working on a version of the software for the PC. Don't expect Amiga performance on a PC, however. PCs lack a standardized graphics blitter chip, so the available wipes will be limited on that platform—in spite of the fact that a VESA Local bus PC is required!

Although you'll be able to launch Scala from Microsoft Windows, Windows will be "frozen" and put aside, while the Scala software takes over the machine. This feat will obviously take a tremendous amount of RAM. Also, the PC's lack of a true multitasking OS prevents pre-loading graphics in the background, which will have a detrimental impact on page transitions. However, the PC version will not have a dongle like the Amiga version does. (Who said life was fair?) My guess is that it will still fare very well against existing PC packages in any event.

Next month we'll take a look at Scala Inc.'s InfoChannel. This product takes Scala to the next level by offering remote site capabilities. ■

The Post-Commodore Amiga?

For the second quarter ended December 31, 1993, Commodore reported a net loss of $8 million. The Wall Street Journal, quoting a Commodore press release, reported "In the absence of additional resources and a restructuring, the company may become subject to reorganization or other liquidation proceedings."

I honestly believe the Amiga technology is too good to just disappear. Debt restructuring may be a possibility; however, Commodore would still need a large cash infusion for marketing and promotion. A more likely scenario would be another company acquiring Commodore (or just the Amiga technology) and continuing to produce Amigas.

All of the developers and dealers I spoke with were still optimistic about the Amiga's future. Supplies of A4000 are plentiful; however, Amiga monitors and A1200s continue to be scarce. Not surprisingly, I have also learned that the US launch of CD32 has been postponed.

RESOURCES

CanDo, $199.95
INOVAtronics, Inc.
8499 Greenville Ave., #209
Dallas, TX 75231
(214)340-4991

Helm, $129
Eagle Tree Software
P.O. Box 164
Hopewell, VA 23860
(804)452-0623

ProFills, $49.95
JEK Graphics
12103 S. Brookhurst St.
Ste. E-125
Garden Grove, CA 92642-3065
(714)530-7603

Video Toaster 4000, $2,395
NewTek, Inc.
1201 South West Executive Dr.
Topeka, Kansas 66615
1-800-847-6111

VLab $499.95
VLab External $549.95
MacroSystemUS
24282 Lynwood D.r, Ste. 101
Novi, MI 48374
(313)347-6266

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The Board of Equalization exempts **print-published** authors from having **to pay sales tax** on the **compensation** (royalties) they receive **from their publishers.**

when delivered on "tangible personal property."

They think diskettes of data are like books, and are ignoring the reseller/end-user issues.

Yeah, the Board of Equalization has a set of regulations concerning books and publishers, and exempts print-published authors from having to pay sales tax on the compensation (royalties) they receive from their publishers. But with backwards-looking myopia, they refuse to apply the same rules to authors of online information who foolishly deliver one copy of it on a diskette.

And rather than challenge some major information author, they have decided to go after a tiny two-person list compiler who naively sent their compilations to Dialog and other resellers on magnetic media rather than by modem. (And then state politicians wonder why job-producing, income-tax-paying high-tech businesses are fleeing California!)

Sure am glad I submit these columns online, and that they're published on pre-landfill ex-forests.

At least there's a bright side: Online distributors don't have to collect a tax-per-byte ransom on the electronic speech and press that their users exchange.

Quickies

- Software publishers: Avoid dark-colored diskettes. Give unto us, light disks upon which we may scribe our notes—visibly (of course, gently using a felt-pen).
- Price-fixing algorithm: Menlo Park's John Nagle suggests indexing the minimum wage—and other entitlements—to national productivity, rather than to the CPI (Consumer Price Index).

The Horse's Mouth

The writer also speaks—at the June 17th Peninsula CivicNet '94 Symposium (for details, call Ruth Nagler, 415-345-1221). ■

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BULLETIN BOARDS cont.

Continued from page 287

14,400. As seen on Hard Copy. 442MB of unusual text. NIRVANAnet HQ. [Exp. #123.]

8-Bit Apple User Group BBS. (510)294-8052. 24 hrs., 300–2400. Apple II, UL/DL, email, games. Free. Sysop: Noel Anklam. [Exp. #125.]

Activist. (510)532-6248. Conspiracy files—CIA, KGB, FBI, JFK, RFK, MLK, NSA, MI5, ADL, CFR, IRS, BATF, FEMA, etc. Sysop: Walter Alter. [Exp. #125.]

Amiga Addicts Anonymous BBS. (510)680-2850. 8-N-1, 24 hrs., 1200–14,400. Amiga files only. Free. Sysop: Stanley R. Poland. [Exp. #124.]

Bay Area Mega Board. (510)247-8300, 12 lines @ 14,400; 247-8313, 4 lines @ 28,800. UltraChat, 26.7GB file area, GIFs, nets, games, news, magazines, weather, products for sale. Free and fee. Sysop: Sam Thompson. [Exp. #124.]

BayB—The Bay Area Baby Board. (510)528-8164. 14,400. Parenting issues and support: local events, classifieds, games, health, reviews. Mac/PC support. Free. [Exp. #123.]

Camphor Fountain BBS. (510)547-5741. 8-N-1, 24 hrs., 2400–14,400. Baha'iNet, SearchNet, seekers welcome, interfaith discussions, writing, home schooling, parenting. Free. Sysop: Linda Martin. [Exp. #125.]

Caxius BBS. (510)895-6961. 24 hrs., 300–14,400. Technical focus, FidoNet & PCC Net support, 60+ msg bases, active debate forum. Free. Sysop: Ed Correia. [Exp. #124.]

CompuPal. (510)538-2040. 8-N-1, 24 hrs., up to 28,800. Christian BBS, IBM PD, Bible files, 160MB, Bible echo, New Life Digest magazines, etc. Sysop: Richard Yim. [Exp. #125.]

Dr. Jack's Thing. (510)685-8522. 6:00 pm–8:00 am. 14,400. Lots of WAVs and GIFs, all the other stuff too. Thousands of new files, programs, utilities. Free/pay. [Exp. #124.]

Francofolies BBS. (510)651-3192. 14,400. Online CD-ROM sharewares, adult, FidoNet, and KinkNet. Reg. required, free. [Exp. #123.]

Fred Haney & Sons BBS. (510)792-5119. 8-N-1, 24 hrs., up to 14,400. Shareware software. Free. [Exp. #124.]

Friendliest BBS. (510)432-7802. 8-N-1, 24 hrs., 300/1200/2400/9600. MS-DOS shareware, email, no password, no U/D ratios, no time limits. Free. Sysop: Doyle Goodman. [Exp. #125.]

Gold Diggers BBS. (510)568-7807,,,23,23 (must include ,,,23,23 to get BBS). 24 hrs., 2400–14,400. IBM, Atari ST, Amiga, Mac; files, door games, and messages. Registration $10 per year. Sysop: Harry Goldberg. [Exp. #125.]

The Golden Palace BBS. (510)237-5338. 24 hrs., 300–2400. Lots of msgs. and files, some online games, BADnet. Free. Sysop: Computer Wiz. [Exp. #124.]

The Hobby Shop BBS. (510)357-4125. 8-N-1, 28,800. Fun place to meet others; 1.5MB, adult scans, FidoNet. Free trial most areas. [Exp. #125.]

Initiative BBS. (510)654-2253. 8-N-1, 14,400. A political board featuring documents and discussion on the left in the US and the future of socialism. Free. Sysop: Steve Willett. [Exp. #123.]

The Lost Worlds BBS. (510)888-1714. Hot new BBS with over 1GB online, adult files and more. [Exp. #123.]

Maddog BBS. (510)483-0203. 24 hrs., 2400–14,400. 20,000+ DOS, Windows, OS/2 files. Adult GIF files. Online CD-ROM shareware, GIFs, etc. Free. Sysop: Troy Earp. [Exp. #124.]

Metropolis. (510)231-0353. 24 hrs., 2400/9600/14,400/19,200. DOS, Windows, OS/2; general purpose, a serious professional system; FidoNet, Usenet, and Internet email soon. Sysop: Michael Chen. [Exp. #125.]

Multimedia Download BBS. (510)713-2752. 1200–14,400. Photo/VHS digitizing service. MIDI, AVI, GIF, WAV, VOC, PCX, shareware. Free. [Exp. #125.]

The New-Ark BBS. (510)796-0947. 24 hrs., 300/1200/2400/9600. Tradewars, running on two CD-ROMs. Reg. required. Sysop: Hiram Wolf. [Exp. #125.]

The Phantom Zone BBS. (510)538-9586. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. Two lines. Online games, offline mail reader, adult files, multinode. [Exp. #124.]

Planet Mirth. (510)786-6560. 14,400. Sinfully silly, Internet news, NIRVANAnet. [Exp. #123.]

Realitycheck. (510)527-1662. 14,400. Instant access, coffee, cigars, tech, and text. NIRVANAnet. [Exp. #123.]

Sequoia Online. (510)685-8388, 370-9345, 799-7809. Investing, tax, nutrition, photo, computer info, estate planning, email, and much more. Free. [Exp. #123.]

Smorgasbord BBS. (510)440-1125. Fremont, Sunnyvale, North San Jose. 70,000 files. Free prize draw. [Exp. #125.]

StarPort Valhalla. (510)522-3583. 24 hrs., 300/1200/2400/9600/14,400. Games, messages (five networks), programming, doors, political/religious debate. Free. [Exp. #123.]

T123 BBS. (510)373-0873. 24 hrs., 9600. Two lines, IBM/Mac files, messages, teleconferencing. Free access. Sysop: Corey L. Nelson. [Exp. #124.]

Terrapin Transit BBS. (510)644-9328. 14,400. Seven lines. IBM, Amiga, Mac, Atari. Internet email, Usenet. Games, downloads, chat. Sysop: Sam Lewit. [Exp. #124.]

VA Listings. (510)637-1261. 24 hrs., 300–9600. Multiline. VA-owned homes for sale. Sysop: David Piersall. [Exp. #124.]

The Weasel Den II. (510)432-0204. 1200/2400. Lrg. assortment of netted msg. areas and topics, WeasNet, VirtualNet, CheapNet, DragonNet, AviationNet. Online games. [Exp. #123.]

Windows Online. (510)736-8343. Largest Windows BBS and publisher of WOL Review. Over 25,000 Win 3.x and 35,000 DOS files. Free limited trial. [Exp. #124.]

Wishing Well BBS. (510)745-7901. 1200/14,400. 85+ online games, quality files, ANSI art, RIP graphics, matchmaker, and more. Sysop: MaryLou White [Exp. #125.]

707

The Party Line BBS. (707)588-8055. 14,400. Eight lines, six CD-ROMs, Internet email and Usenet newsgroups, chat link, 1.2GB of MS-DOS and Mac files. Sysop: Jami Chism. [Exp. #124.]

916

24th Street Exchange. (916)448-2483. 8-N-1, 24 hrs., 300–28,800. 27 lines, 21 CDs, FidoNet, USA Today, PC catalog, Internet email, chat. [Exp. #125.]

Intel Application Support. (916)356-3600. 24 hrs., 14,400. Technical files for designers using Intel components. 1-800-897-2536 master file list only. Free. Sysop: Franklin Wang. [Exp. #124.]

USER GROUPS

AMIGA

AGA. Meetings: 7th of each month, downtown San Francisco. Graphics user group for 3-D/2-D, animators, multimedia, and videographers. Call: Ollie, (415)863-8792. [Exp. #123.]

AUM—Amiga Users Of Marin. Meetings: 3rd Wed., 7:30 pm, College of Marin Science Center, Rm. 191, Kentfield. Desktop Video SIG, Rm. 192, 6:00 pm. Call: (415)479-6717. BBS: (415)459-6621. [Exp. #126.]

AWEST Amiga Users In SF. Meetings: 2nd Wed., 6:30 pm, Excelsior Branch Public Library, 4400 Mission St. (near Ocean), San Francisco. Call: (415)584-8406. [Exp. #126.]

RE-AMIGA Redwood Empire Amiga User Group. Meetings: 2nd Tues., 7:30 pm, Rohert Park Jr. HS, Rm. C-5, 7165 Burton Ave., Rohnert Park. Call: (707)523-9978. BBS: (707)539-6944. [Exp. #126.]

TOGA—The Other Group Of Amigoids. Meetings: Varying Sat., 12:30 pm, Milpitas Community Library, 40 N. Milpitas Blvd., Milpitas. An informal group to share ideas, PD software, and information. Call: Lawrence Brown, (408)984-6036; Randy Abel, (408)356-9405; toga@cup.portal.com . [Exp. #127.]

APPLE

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #126.]

SPC Apple User Group. Meetings: 2nd Tues., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Dean Fearn, (510)881-9160. [Exp. #127.]

ATARI

Northern California Atari Computer Enthusiasts. Meetings: 3rd Tues., 7:30 pm, Pac Bell Bldg., 3260 Sebastopol Rd., Santa Rosa. Call: Kim Remick, (707)795-8173. [Exp. #126.]

CAD

Southbay AutoCAD User Group. Meetings: Last Thurs. on even months, 6:00 pm. Food, prizes, and more. Call: Dean Villegas, (408)282-4448. [Exp. #126.]

COMMODORE

C=HUG (Commodore Hayward User Group). Meetings: 2nd Sat., 2:00 pm, Palma Ceia Park. (510)531-3734. [Exp. #128.]

CWEST Commodore 64/128. Meetings: 2nd. Wed., 6:30–8:45 pm, Excelsior Library, 4400 Mission, San Francisco. San Francisco. Call: (415)626-9946. [Exp. #126.]

DEC

BayLUG. Digital Equipment Computer User's Society Local User Group. For users of DEC and other hardware. Call: Rich Taylor, (408)776-4978. [Exp. #127.]

DESKTOP PUBLISHING

Corel Ventura/Ventura Publishing User Group (San Mateo County VPUG). Meetings: 3rd or 4th Mon. (Sept.–May), 6:45 pm, 1800 Rollins Rd., Rm. 14, Burlingame. Call: Elinor Cruze, (415)366-5317. [Exp. #125.]

ELECTRONIC PHOTO-IMAGING

EPUG—Electronic Photo-Imaging User's Group. Meetings: 3rd Friday, 7:00 pm, Ewert's Photo-Scientific, 20[illegible]0 Duane Ave., Santa Clara. Call: Rik Franz or Jerry Chapman, (408)727-3686. [Exp. #128

IBM AND COMPATIBLES

EastBay FOG. Meetings: 2nd Wed., 7:30 pm, Episcopal Church of St. John-in-Montclair, 1707 Gouldin Rd., Montclair. All microcomputers, MS-DOS, CP/M. Call: (510)653-2627. [Exp. #128.]

Golden Gate Computer Society. Meetings: 4th Mon., 7:00 pm, San Rafael Community Center, 618 B St., San Rafael. Free intro to computers class at 6:00 pm. Call: (415)454-5556. [Exp. #124.]

Napa Valley PC Users Group. Meetings: 2nd Wed., 7:30 pm. Call: Lee Schwab (707)257-2675. [Exp. #123.]

OS/2 BAUG Enterprise Computing SIG. Meetings: 3rd Mon., 7:00 pm, IBM, 425 Market St., 22nd floor, San Francisco. Call: Larry Baptist, (510)675-2466; Steve Burton, (510)686-1408. [Exp. #127.]

San Francisco Business Computers. Meetings: 4th Tues., 5:30 pm. 110 Pacific #153, San Francisco. For those who use computers in business. Visitors $5. Call: Jordan Rosenberg, (415)788-5338. MCI Mail: 425-1545. [Exp. #127.]

San Francisco Computer Society. Meetings: 1st Mon., 7:00 pm, Presbyterian Church, 1329 7th Ave., San Francisco. Call: Bob Forsberg, (415)885-6202. [Exp. #123.]

San Francisco PC Users Group. Meetings: 3rd Tues., 6:15 pm SIGs, 7:30 pm General Meeting. St. Mary's Conference Center, 1111 Gough St., San Francisco. Call: (415)346-2644. [Exp. #128.]

South Bay WordPerfect User Group. Meetings: 4th Tues., Saratoga Community Library. Free. Call: Scott Maiden, (408)253-4591. [Exp. #124.]

Stanford Palo Alto Area PC User Group. Meetings: Last Wed., 7:30 pm, Varian Auditorium, 3075 Hansen Way (off Page Mil Road), Palo Alto. Call: (415)329-8252. [Exp. #128.]

Terminal Transfer User Group. For Info, send S.A.S.E to Dave Blair, 2440 16th St., #171, San Francisco, 94103. Or Call: (415)431-7621. [Exp. #123.]

LAPTOPS

Laptops & Handhelds. Meetings: 2nd Sat., 10:30 am, Sunnyvale. Call: Michael Felsenstein, (415)564-8279. [Exp. #123.]

LEGAL

SF Bar Assoc. WordPerfect User Group. Meetings: 3rd Wed., odd-numbered months, noon, SF Bar Assoc. Boardroom, 7th Fl., 685 Market St. Brown bag meetings. Call: (415)421-5650. [Exp. #128.]

MACINTOSH

AHUG—Apple HyperCard User Group. Meetings: 3rd Thurs., Apple Computer, Bldg. 4, 4 Infinite Loop Way, Cupertino. Meetings include speakers and topics for beginners and experienced HyperCard and AppleScript users. Call: (408)974-1707. [Exp. #126.]

Diablo Valley Macintosh User Group (DVMUG). Meetings: 3rd Tues., 7:00 pm, Bancroft School, 2200 Parish Dr., Walnut Creek. Get together with Mac and Performa users. Enjoyable SIG meetings. Call: (510)827-5775. [Exp. #128.]

International Macintosh Users Group (IMUG). Meetings: 3rd Thurs., 7:00 pm. A forum for multilingual/multiscript computing. Call: Roger Sherman, (415)859-5146. [Exp. #128.]

PAUG—Peninsula Apple User Group. Meetings: 3rd Thurs., 7:00 pm, Ampex Cafeteria, 411 Broadway, Redwood City. Beginners and advanced, question and answer, new product demos, public domain software. Call: Kent Fillmore, (415)571-1433. [Exp. #126.]

SEF Macintosh SIG. Meetings: 3rd Tues., 7:00 pm, Apple Cafeteria, City Center 4, De Anza and Rodrigues, Cupertino. Sponsored by Software Entrepreneurs' Forum. Call: Jeff Cherniss, (408)358-5150 or Barbara Cass, (415)854-7219. [Exp. #128.]

Sequoia Macintosh Users' Group—SMUG. Meetings: 2nd week, 7:00 pm, Founders Hall, Rm. 118, Humbolt State University, Arcata. Call: (707)442-3520. [Exp. #127.]

SPC Apple User Group. Meetings: 2nd Tues., 7:30 pm, Fremont Main Public Library. The Society for Prevention of Cruelty to Apple Computers Users Group supports all Apple and Macintosh computers. Call: Dean Fearn, (510)881-9160. [Exp. #127.]

MULTIMEDIA

SEF Multimedia SIG. Meetings: 1st Thurs., 7:00 pm, Center for Software Development, 111 W. St. John St., Suite 200. Downtown San Jose. SIG of Software Entrepreneurs' Forum. Call: Ralph Gilman, (408)746-0551. [Exp. #128.]

OS/2

OS/2 Bay Area User Group. Meetings: 4th Mon., 7:00 pm. For anyone interested in OS/2. Presentations, product demos, questions and answers. Call: (415)948-9186. [Exp. #128.]

PEN COMPUTING

Pen Software SIG. Meetings: 4th Wed., 7:00 pm, Cubberley Community Center, Rm. H-1, 400 Middlefield Rd., Palo Alto. SIG of Software Entrepreneurs' Forum. Call: Bill McAlpine, (415)348-2257. [Exp. #123.]

POINT OF SALE

Point Of Sale User Group. Meetings: 1st and 3rd Sat., 2025 E. 12th St., Oakland. Call: (510)216-9335. [Exp. #125.]

PROGRAMMING LANGUAGES

SEF Visual BASIC SIG. Meetings: 2nd Thurs., 7:00 pm, Cubberley Community Center, 4000 Middlefield Rd., Rm. H-1, Palo Alto. Sponsored by Software Entrepreneurs' Forum. Call: Allan Colby, (415)851-4567. [Exp. #127.]

Silicon Valley Forth Interest Group. Meetings: 4th Sat., 10:00 am–5:00 pm, 230 Lincoln Centre Dr., Foster City. Call: Dr. C.H. Ting, (415)571-7639. [Exp. #127.]

Visual C++ Bay Area Developer's Group. Meetings: 3rd Wed., 6:00 pm, Berkeley. For agendas, location, and RSVP, call: (510)254-9700, ext. 490. [Exp. #123.]

TEXAS INSTRUMENTS

TI-99/4A. Meetings: 2nd Sat., Oakland. Call: Fred, (510)530-8335. [Exp. #128.]

VIDEO TOASTER

Video Toaster User Group. Meetings: Last Thurs., 7:30 pm, HT Electronics, 275 N. Mathilda Ave., Sunnyvale. Special guests, equipment demos, hands-on workshops, plus info/tips on new System 3.0. Call: Andrew Timmins, (408)243-9233 (eve.). [Exp. #126.]

WINDOWS

SEF Windows SIG. Meetings: 1st Wed., 6:30 pm, Cubberley Community Center, Room H-1, 4000 Middlefield Rd., Palo Alto. SIG of the Software Entrepreneurs' Forum. $10 for nonmembers. Call: Fran Finnegan, (415)288-4400. [Exp. #128.]

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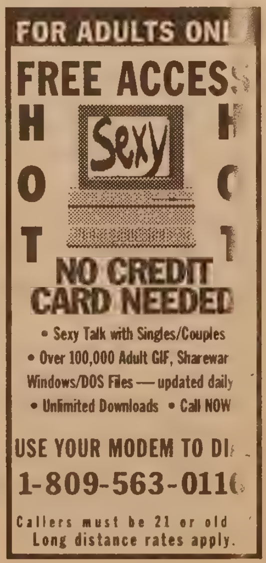
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ASSOCIATIONS

American Association For Artificial Intelligence. Meetings: Individuals interested in learning about the use and application of AI. Call: (415)328-3123, fax: (415)321-4457, email: membership@aaai.org. [Exp. #126.]

The Assembler Multitude. Meetings: 2nd and 4th Mon., 7:30 pm, University Lutheran Church, 1611 Stanford Ave., Palo Alto. An open discussion of new technical developments in many fields and how they relate to nanotechnology. Call: (408)974-6241. [Exp. #128.]

The Association For Customer Support Professionals (ACSP). Meetings: Quarterly. Dedicated to the development and furtherance of customer support as a distinct profession, to the growth of the support community, and to the improvement of support service. Call: (510)865-4515. Email: tao@well.sf.ca.us or 71333,2116@Compuserve.com . [Exp. #126.]

Association For Women In Computing. Meetings: 1st Wed., 6:00 pm, Sinbad's Restaurant, Pier 2, San Francisco Embarcadero. $15 members, $20 guests. Call: (415)979-8450. [Exp. #128.]

Bay Area Video Coalition. A place for independent videomakers to communicate with each other and the larger media community. $10 for nonmembers. Call: Anne Etheridge, (415)861-3282. [Exp. #128.]

Black Data Processing Associates, Silicon Valley Chapter. Meetings: 4th Thursday, 6:30 pm, Amdahl Corp., Bldg. H, 1240 E. Arques Ave., Sunnyvale. National network of DP professionals, educators, students, and vendor reps. Call: Willie Mackey, (408)280-7624. [Exp. #128.]

Business Marketing Association. Meetings: 4th Wed., 11:30 am, Marriott Hotel on Great America Pkwy., Santa Clara. A professional organization for business-to-business marketing professionals; CBC certification, topical programs, seminars, job bank. Call: (408)365-9815. [Exp. #127.]

Computer Professionals For Social Responsibility. Meetings: Last Sun., 2:00 pm, BMUG Offices, 2066 Center St., Berkeley. Call: (510)987-0567. Email: kec@stubbs.ucop.edu . [Exp. #123.]

Foresight Institute. Meetings: 123 Fremont Ave., Los Altos. Information about and discussion of nanotechnology and other anticipated technologies. $35 annual membership. Call: (415)917-1122. [Exp. #128.]

Historical Computer Society. 10928 Ted Williams Pl., El Paso, TX 79934. A nostalgia group for enthusiasts of older computers and their history. Main forum is *Historically Brewed* newsletter; $18/yr., $3 sample. Call: David A. Greelish, (915)822-2683. [Exp. #127.]

IEEE Computer Society, San Francisco Chapter. Meetings: alternating Weds., 7:30 pm, SF State. Call: (415)905-4400. [Exp. #123.]

Independent Computer Consultants Association, Northern California Chapter. Meetings: Dinner: 2nd Tues., 6:00 pm; Breakfast: 4th Thurs., 7:30 am; The City Club, 155 Sansome St., San Francisco. Open discussion, questions and answers. Call: (415)399-0305. [Exp. #128.]

North Bay Systems Professionals. Meetings: 3rd Wed., 6:00 pm networking, 7:00 pm dinner, 8:00 pm speaker. Embassy Suites Hotel and Conference Center, 101 McInnis Parkway, San Rafael. NBSP provides a forum for systems professionals to grow and to benefit from a network of other like professionals. Call: (415)721-4409. [Exp. #128.]

Robotics Society Of America. Meetings: 1st Mon., 8:00 pm, Exploratorium Library. Call: Brad Smallridge, (415)550-0588. [Exp. #128.]

Society For Technical Communication, San Francisco Chapter. Meetings: 3rd Wed., 6:00, program at 7:00 pm. Stagecoach Restaurant, 44 Montgomery St., San Francisco. For technical writers, editors, and other technical communicators. Some meetings are dinner meetings, for which reservations are necessary. Call: (415)985-7121. [Exp. #123.]

Society For Technical Communication, Silicon Valley Chapter. Meetings: 4th Thurs. 5:30 pm refreshments, 6:30 pm dinner, 7:15 dessert. Sunnyvale Hilton, 1250 Lakeside Drive (off Lawrence Expressway at 101). Guest speakers, special interest groups, networking, job listings, newsletter. Call: (408)737-9426. [Exp. #127.]

Software Entrepreneurs' Forum. 3rd Wed., 6:30 pm, Elk's Lodge, 4249 El Camino Real, Palo Alto. Industry association dedicated to software developers and entrepreneurs, offering information and education on all facets of the software industry. Call: Information, (415)854-7219; reservations, (415)965-9003. [Exp. #126.]

Software Process Improvement Network. Meetings: 3rd. Wed., San Ramon. For people interested in software process improvement, including theory and practical experience. Free. Call: Janet Deeney, (510)823-2348. Email: jmdeene @pbl.pacbell.com . [Exp. #123.]

United Sysops Association (U.S.A.). Meetings: 2nd Wed, 7:30 pm, call for location. Call: Beth Hall, (408)522-8690. [Exp. #123].

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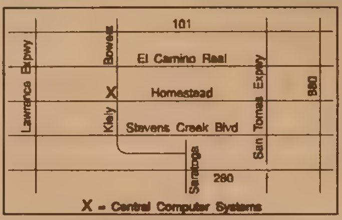

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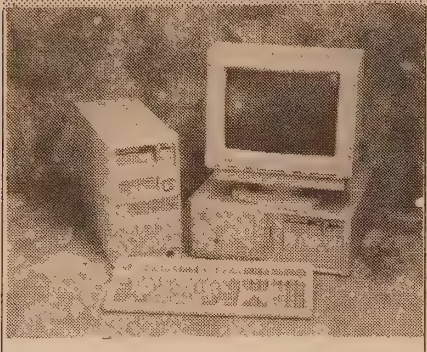
SYSTEMS



BASIC SYSTEM INCLUDES :

4 MB RAM Memory
TEAC 1.44MB Floppy
IDE Controller
I/O 2S 1P
Baby AT Case w. 200W
Mitsumi 101 Keyboard
MS Serial Mouse
MS DOS 6.21
MS Windows 3.11

MOTHERBOARD	BASIC	BASIC + 170MB HDD	BASIC + 170MB HDD + VGA CARD + 14" SVGA Monitor
MICRONICS COMPUTERS INC.			
486-DX2-66 ISA 256K cache VLB	$1079	$1259	$1605
486-33 ISA 256K cache VLB	$959	$1139	$1485
486-33 EISA 256K cache VLB	$1219	$1399	$1745
486-DX2-66 EISA 256K cache VLB	$1339	$1519	$1865
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486-DX2-66 EISA 256K VLB	$1169	$1349	$1795
486-DX2-66 ISA 256K VLB	$999	$1179	$1525
486-33 ISA 256K VLB	$879	$1059	$1405
486-DX2-66 Mini EISA 256K VLB	$1059	$1239	$1585
Green Pentium Super P54VL-PCI made in USA			
586-90 Flash Bios 256K with automatic power saving	8MB $2069	$2249	$2595
586-100 Flash Bios 256K with automatic power saving	8MB $2449	$2629	$2975
586-60 Flash Bios 256K with automatic power saving	8MB $1759	$1939	$2285
586-66 Flash Bios 256K with automatic power saving	8MB $1849	$2029	$2375

HARDWARE

1. CD ROM & SOUND CARD

CREATIVE LABS

CD 531 w. Kit Ext	139
Discovery CD 16 Int	299
Edutainment CD 16 Int	379
Game Blaster 16 CD Kit	389
Midi Kit	59
Sound Blaster Pro Deluxe	75
Sound Blaster 16 MCD / ASP	145/179
Sound Blaster 16 SCSI / ASP	165/195
Sound Blaster AWE 32	279
Video Blaster SE	245
Video Spigot for Windows	239
Wave Blaster	189

MEDIA VISION

Fusion CD 16 Int	*(175)
Fusion Double CD 16 Int	*(299)
Midi Mate	49
MV2000 Family Deluxe Kit	345
MV3000 Super Deluxe Kit	395
MV4000 Premium Deluxe Kit Ext.	515
MV5000 Tripple Speed Deluxe Kit	695
Pro Spectrum 16 Multimedia Kit	*(385)
Pro 16 Multimedia System II	*(435)
Pro Audio Spectrum 16	87
Pro Audio Studio 16	118

MITSUMI

FX-001D 250ms Double speed w. Kit	145

NEC

CDR510 195ms, Triple speed Int	355
3XI 195ms, 450Kb/s, Triple speed Int	435
3XE 195ms, 450Kb/s, Triple speed Ext	449
3XP Portable, Triple speed	415
Interface Kit for PC	69

PLEXTOR (TEXEL)

DM-3028 240ms, Int / w. controller	265/310
DM-5028 240ms, Ext / w.controller	379/424
Driver Kit for Media Vision Int / Ext	19/49

TOSHIBA

3401B 200ms, 330Kb/s, Int / w. cont.	299/344
3401E 200ms, 330Kb/s, Ext	385
- with original Toshiba Case	419

TURTLE BEACH

Maui Synthesizer	139
Monterey Multisound	375
Tahiti Multisound	265

OTHERS

CD Caddy	4.99
Speakers :	
Active 75 Hi-Fi Amplifier Speakers	65
Active B789 120W Speakers	75
Active SP-690 Amplified Speakers	42
Altec ACS50 Speaker Systems	75
Labtec Speakers CS150	19
Sound Cards :	
Gravis Ultrasound	129
SIIG Play Computer Games On Your TV	155
Trantor T130 SCSI Interface Kit (w/o cable)	45

2. CASE

Baby AT w. 200W Power	65
Baby Tower w. 200W Power	65
Mid Tower w. 230W Power	79
Mid Tower w. 250W Power: Black / White	139/129
Full Tower w. 250W Power	129
Full Tower w. 300W Power: Black / White	199/189
Pro Line Media Baby AT 250W built-in speakers	129
Slim (2 drive bay) w. 130W Power	79
Hard Disk Drive External Casing	
- 1 half ht or SCSI for Mac, 40W, w. cables	79
- 2 half ht or 1 full ht for PC, 60W	99
- 2 half ht or 1 full ht for Mac, 60W, w. cables	125
- 3 half ht or 1 full & 1 half ht for PC, 60W	119
- 3 half ht or 1 full & 1 half ht for Mac,w.cables	145

3. CONTROLLER

ADAPTEC

1522A Fast SCSI w. Kit, 3Mb/s	145
1542CF SCSI 10Mb/s / w. Kit	175/239
2742T SCSI EISA w. Kit	365
2842VL SCSI VLB / w. Kit	269/289
2940 PCI SCSI w. Kit	279
ASW-1440 ASPI Netware Manager v3.3	65
ASW-310 Sy-Tos Plus (tape backup s/w)	*(85)99
ASW-EZ SCSI for Dos & Windows	69

BUSLOGIC

BT 445S SCSI VLB w. Kit oem / reg.	255/275
KT 542B SCSI-2 w. Kit	199
KT 545S Fast SCSI-2 w. Kit, 10Mb/s	209
KT 747S Fast SCSI-2 EISA w. Kit	365
KT 946C SCSI PCI w. Kit (supports 8GB HD)	299

COREL

Corel SCSI Software v1.2 / v2.0	69/89
Corel SCSI CD Power	69

DTC

2278VL 32 bit, IDE w. I/O	39
3280SAS SCSI	105

FUTURE DOMAIN (SCSI)

TMC-1660 for AT (HD only)	119
TMC-1660 SVP	127
TMC-1680 for AT, 15Mb/s, (4F&H)	129
TMC-1680 SVP (SCSI Value Pack)	145

KOUWELL

IDE Controller only	27
IDE w. AT I/O (2S 1P 1G)	34
IDE w. AT I/O (2S 1P 1G) w. 16550 chips	59
IDE w. AT I/O (2S 1P) VLB	49
IDE w. AT I/O (2S 1P) VLB w. 16550 chips	69

PROMISE (drive cache)

DC-200 IDE cache up to 16MB	95
DC-420 IDE VLB w. 512k cache up to 1MB	109
DC-4030VL IDE VLB cache up to 16MB	125
DC-2040 Bios Chips & CD Driver	25

QLOGIC

Fast SCSI ISA w. Kit	125
Fast SCSI EISA w. Kit	199
Fast SCSI VLB w. Kit	189
Fast SCSI PCI w. Kit	299

ULTRASTOR (w/o cable)

ULT14F ISA SCSI w. 32k cache	175
ULT34F VLB SCSI-2 w. 32k cache	235

VITEX

IDE w. I/O (2S 1P) VLB	45
IDE w. 4FD/ 2S 1P/ 16550 chips	49
IDE w. 4FD/ 4S 2P 1G/ 2S16550/ VLB	89

WONDER SYSTEMS (USA made)

IDE w. 4FD/ 2.88MB/ drivers tape, 1.0 Mbps FD speed	35
IDE w. 2HD/ 4FD/ 2S 1P/ drivers tape/ 5IRQ for com ports, 1.0Mbps FD speed	39
IDE w. 4FD/ 3S 2P 1G/ 2S16550 chips	69
SCSI w. CD Rom drivers	49
VL2000 IDE VLB w. AT I/O	45
VL2018 IDE VLB w. 2HD/ 4FD/ 2S 1P/ 16550 chips/ 2.88MB	69

OTHERS

PCI SC200 SCSI-2 (NCR chip)	99

4. CPU & MATH CO

CPU :

AMD

386 DX-40 / 486-DX2-66	59/339

INTEL

386 DX-33	59
486 DX-33 / 486 DX-50	259/399
486 DX2-50 / 486 DX2-66	315/389
Pentium 586-60	709
Pentium 586-66	789
Pentium 586-90	959

Math Co Processor :

CYRIX

83D86 - 33	59
83D87 - 40	59
Cx486 DLC TI-33	75
Cx486 DLC TI-40	85

INTEL

387 DX (for 16 / 20 / 25 / 33 MHz)	85
387 SX (for 16 / 20 / 25 / 33 MHz)	79

OTHERS

Cooling Fan (heat sink)	9

5. DIGITIZER

SUMMASKETCH

III 12 x 12, 4 or 16 button	269
III 12 x 18, 4 or 16 button	549

WACOM

UD-0608R 6 x 8, UP-201 Pressure Stylus	349
UD-1212RP 12 x 12, UP-201 Pres. Stylus	529

6. DRIVE

FLOPPY DRIVES :

MICRO SOLUTIONS (external)

1.2 / 1.44 (use printer port)	149

SYQUEST (removable)

88MB 5.25" w. 88MB cartridge for Mac, Ext	439
105MB 5.25" w. cartridge for Mac,Ext,SCSI	399
105MB 3.5" w. cart. & SCSI cont. for PC,Int	359
105MB 3.5" w. cart., printer port for PC, Ext	399
105MB 3.5" w. cart., IDE host adapter	299
270MB 3.5" w. cartridge, IDE, Int	499
270MB 3.5" w. cartridge, SCSI, Ext	549
270MB 3.5" w. cart., printer port for PC, Ext.	549
105MB Cartridge	59
270MB Cartridge	89

TEAC

1.2MB 5.25"	47
1.44MB 3.5" / w. frame	37/41
2.88MB 3.5" w. frame	85
Dual - 1.2MB & 1.44MB	99

*(price) .... special, while supply last

HARD DRIVES :

CONNER

CFS-210A 213MB 14ms IDE 1" ht	199
CFA-340A 340MB 13ms 64k IDE 1" ht	245
CFA-340S 340MB SCSI	329
CFS-420A 420MB 14ms IDE 1" ht	265
CFA-540A 540MB 12ms 256k IDE 1" ht	349

FUJITSU (5 yr. warranty fr. Fujitsu)

M2694ESA 1.0GB 10ms SCSI-2 3.5" 1/2 ht	725

MAXTOR

MXT-7171A 170MB 15ms IDE 3.5"	185
MXT-7290S 290MB 14ms SCSI	279
LXT-7345A 345MB 14ms IDE 3.5"	255
MXT-7345S 345MB 15ms SCSI 1" ht	339
MXT-540A 540MB 8.5ms IDE 1" ht	379
MXT-540SL 540MB 8.5ms SCSI-2 1" ht	449
MXT-1240S 1.2GB 8.5ms SCSI-2 3.5"	1055
Optical Rewritable 1.3GB 19ms SCSI, 4MB Ext Tahiti III w. Adaptec 1542 & Plastic Cart	2830
1GB Glass Cartridge	165
1GB Plastic Cartridge	135

MICROPOLIS

MC4110A 1.0GB 8.5ms 512k IDE 1/2ht	759
MC4110S 1.0GB 8.5ms 512k SCSI-2 1"ht	749
MC2117A 1.75GB 10ms 512k IDE 1/2 ht	1085
MC2117S 1.75GB 10ms 512k SCS-2 1/2ht	1085
MC1926S 2.1GB 13ms 512k SCSI-2 full ht	1495
MC1936S 3.0GB 11ms 256k SCSI full ht	2195

QUANTUM

EIS-170AT 170MB IDE	179
LPS-270AT 270MB 12ms 128k IDE	235
LPS-340AT 344MB 12ms 128k IDE	259
LPS-340S 344MB 12ms 128k SCSI	299
LPS-525AT 525MB 10ms 512k IDE	379
LPS-540S 540MB 12ms 128k SCSI	399
EP1080S 1.08GB 9.5ms SCSI-2	729
PRO-1225S 1.2GB 10ms 512k SCSI-2	899
PRO-1800S 1.8GB 10ms 512k SCSI-2	995

SEAGATE

ST3243A 214MB 16ms 32k IDE	205
ST3290A 261MB 16ms 64k IDE	219
ST3391A 341MB 12ms 256k IDE	269
ST3655A 545MB 12ms 256k IDE	399
ST3600N 525MB 10ms 256k SCSI-2	415
ST31200N 1.05GB 9ms 256k SCSI-2	769
ST12550N 2.14GB 8ms 1M SCSI-2	1715
ST43400N 2.9GB 10ms 512k SCSI-2	2069

OTHERS

Impression CardDrive (2 slot PCMCIA)	185
Mounting Frame for 3.5" Hard / Floppy Drive	6
Removable Case for 3.5" HD IDE	39
Removable Case for 3.5" HD SCSI	42

7. I/O CARD

BOCA (fast chip serial)

Bocaboard w. cable (IRQ 3,4,5,7,10,11,12,15) - 4 port / 8 port / 16 port	79/119/239

KOUWELL

AT I/O (2S 1P)	27
AT I/O (2S 2P)	33
AT I/O (2S 1P 1G)	27
AT I/O (2S 1P 1G) w. NS16550 chips	49
AT I/O (2S 1P 1G) w. IDE controller	34
4 Serial Ports	55
Printer Card (2P)	15
Serial Card (XT, AT)	15

QUICKPATH

13 Port I/O w. 4-16550UARTs + Extd. IRQs (2IDE, 4F, 4S, 2P, 1G)	125
4 Serial, 16550UARTs, 8addr, 10IRQs (3,4,5,7,9,10,11,12,14,15)	99

SIIG (5 yr. warranty)

(2S 1P) w. 16550 chipset	49

STB 4-COM

4 Serial, 16 bit, w. 16554, support Com 1-8, IRQ (2,3,4,5,10,11,12,15)	109

VITEX

AT I/O (2S 2P) w. 16550 chips	45

8. KEYBOARD

ANCER (black)

101 Key	42

FOCUS

FK2001 101 Click	42
FK9000 129 Key Programmable	59

NORTHGATE OMNI

101NI	69
102	69
Ultra T	95

SIIG (5 yr. warranty fr. SIIG)

Suntouch 101 Click	49
Suntouch Jr. 84 Key Mini	45
Supertouch 101 Click	53
Wave Touch 101 Soft	39

OTHERS

BTC 84 Key Mini	37
Keycat II 101 w. trackball mouse	65
Keytronic 101	37
Maxi 101	35
Maxi Key 124	59
Mitsumi 101	30
PT505C 101	25

9. MEMORY

DRAM

1MB x 1 - 80ns	6.20
256K x 4 - 80ns	5.50

SIMM

1MB x 9 - 60ns / 70ns / 80ns (3 chips)	40/39/38
4MB x 9 - 60ns / 70ns	165/159
16MB x 9 - 70ns	779
256K x 9 - 70ns / 80ns	14/13
1MB x 36 - 60ns / 70ns	175/165
4MB x 36 - 60ns / 70ns	679/669
2MB x 36 - 70ns	330
8MB x 36 - 70ns	1280
Simm Mac: 4MB x 8 - 70ns / 80ns	159/155

SIPP

1MB x 9 - 70ns (3 chips)	41

COMPUTER MEMORY (3rd Party)

Compaq	
for Deskpro 386N - 2MB /4MB /8MB	109/199/369
for Deskpro 386SX20 - 2MB / 4MB / 8MB	109/159/319
for Deskpro 386-20e/ 20/ 25e - 4MB	225
for Deskpro 486M - 2MB / 4MB / 8MB	109/199/369
for LTE 286 - 2MB / 4MB	129/195
for LTE 386S-20 - 4MB	239
for SLT 286 - 1MB / 4MB	99/259
for Prolinea 386-25ZS/ 25S - 2MB / 8MB	105/379
for ProLinea 486-33/ 50/ 25S - 4MB / 16MB	175/639
IBM	
for PS/2 50Z/ 55SX/ 65SX/ 70 - 2MB / 4MB	129/229
for PS/2 80-111/ 311/ 121/ 321 - 4MB	225
for PS/2 80-A21/ A31/ A6 - 4MB	229

KINGSTON MEMORY

current price	call

LAPTOP / NOTEBOOK (3rd Party)

AST	
for Exec - 4MB	155
Compaq	
for Contura 3/20/ 25 - 4MB / 8MB	220/379
for LTE-Lite 20/ 25/ 25C - 4MB / 8MB	249/399
IBM	
for L40SX/ N33SX - 4MB / 8MB	199/399
Macintosh	
for Powerbook 140/ 170 - 6MB	299
NEC	
for Ultralite III-SL25C/ SX20 - 4MB / 8MB	239/419
Packard Bell	
for 386SX - 2MB / 4MB	155/259
Panasonic	
for 170/ 270/ 370 - 1MB	99
Toshiba	
for T1600 - 2MB	139
for T2200SX - 2MB / 4MB / 8MB	119/229/379
for T3100SX - 2MB / 4MB	129/209
for T3200 - 3MB	169
for T3200SX - 2MB / 4MB	129/209
for T3400 - 4MB / 8MB	239/449
for T5100 - 2MB	129
for T5200/ T8500 - 2MB / 8MB	129/449
for T6400 DX / SX / SXC - 4MB / 8MB	220/379

LASER PRINTER MEMORY UPGRADE

JET RAM (3rd party) :

Epson	
for EPL6000 - 2MB / 4MB	155/245
HP	
for Desk Jet 500/500C - 256k	69
for Laser Fax - 1MB	80
for Laser Jet II/ IID -1MB / 2MB / 4MB	99/145/235
for Laser Jet III/ IIIP/ IIID - 1MB / 2MB / 3MB / 4MB	79/125/169/215
for Laser Jet 4/ 4M - 4MB / 8MB	199/389
Panasonic	
for KX-P4410/ 4430 - 1MB / 2MB / 4MB	95/139/229
for KX-P4420/ 4450i - 1MB / 2MB / 4MB	99/145/235
for KX-P4450 - 1MB	139
for KX-P4455 - 2MB	169
for KX-P4400/ 5400 - 2MB	185
QMS	
for PS410 - 1MB / 2MB / 4MB	99/145/235
for PS815/ 825 - 2MB / 4MB	159/249
Texas Instruments	
for Micro Writer - 1MB	69
for Micro Laser Turbo XL - 1MB	69
PACIFIC DATA :	
Pacific 4 for HP IIP+/ IIIP/ III/ IIID - 1MB / 2MB / 4MB	89/135/225
1-2-4 Plus for HP II/ IID - 1MB / 2MB / 4MB	115/159/249
Pacific 4 SIMM	
for HP 4/ IIISi/ XL300 - 4MB / 8MB	189/375
for ProTracer - 5MB / 8MB	365/515

10. MODEM & FAX

BOCA

14.4 Fax modem Int / Ext	99/135
14.4 Pocket Fax modem	169
28.8 Fax 14.4 modem Int / Ext	199/235

GVC

14.4 Fax modem Int / Ext	109/129
PCMCIA 9624 Fax / 144 Fax	129/235

HAYES

Accura 2400 Int / Ext	65/75
Accura 96 + Fax Int / Ext	159/169
Accura 144 + Fax Int / Ext	165/179
Accura 28.8 Fax 14.4 Ext	*(295)349
ESP Communication Single / Dual	85/125
Optima 144/144 Fax modem Ext	389
Optima 288 V.Fast 144 Fax Ext	435
PCMCIA Optima 144 Fax	299
SmartCom for Windows	*(47)

INTEL

Faxability Software	*(25)
Faxability Plus/OCR for Windows 2.0	*(75)85
New Fax modem 24/96 Int	55
New Fax modem 96 Int / Ext	119/139
New Fax modem 144 Int / Ext	129/149
PCMCIA 144 Fax modem	*(259)
SatisFAXtion modem w. Faxability software	
- 400 144/144 v.42, v.32bis, MNP5 Int	269
- 400e 96/144 4k data buffer Ext	*(289)325

MEGAHERTZ

PCMCIA XJ124FM 96/24 Fax w. X-Jack	*(195)
PCMCIA XJ1144 144 Fax w. X-Jack	*(295)
P2144 Pocket 144/144	255

MICROCOM

Deskporte ES 28.8 Fast 14.4 Fax Ext	245
Deskporte EP 28.8 Fast 14.4 Fax Ext	435
Microporte 4232bis Fax modem	465

PRACTICAL PERIPHERALS

Fax Me (turn HP laser to fax receiving)	*(99)
Mini Tower 144FX144 Ext (w. free Compuserve)	*(169)
PM144FX144 Int	159
Pocket 144 Fax modem	299
PCMCIA 14.4 Fax modem	279
28.8 Fax 14.4 Ext	399

SHIVA

Net modem/E Ethernet BNC/TP	1475

SMARTLINK

1414BAV 14.4 Fax Int	105
1414AV 14.4 Fax Ext	125
1414PAV Pocket 14.4 Fax	169

US ROBOTICS

Courier 16.8 Int / w. Fax	435/475
Courier 16.8 Ext / w. Fax	465/525
Courier v32 Terbo Fax 19.2MB w. ASL Int	359
Courier v32 Terbo Fax 19.2MB w. ASL Ext	399
Sportster 144/144 Fax MNP5 Int / Ext	119/139
Sportster 144/144 for Mac Ext	149
Worldport PCMCIA 14.4 Fax	275

ZOOM (7 yrs. warranty fr. Zoom)

96/96 w. WinFax Lite Int / Ext	125/145
144/144 w. WinFax Lite Int / Ext	135/155
144/144 Fax modem & Voice Int / Ext	165/185
28.8 V. Fast 14.4 Fax Int / Ext	215/235

ZY-XEL

U1496B 16.8 voice 14.4 Fax w. Win s/w Int	289
U1496+ upgradable to 19.2Kbps Int	397
U1496E 16.8 voice 14.4 Fax, LED Ext	299
U1496E+ upgradable to 19.2Kbps Ext	399
U1496P Portable 16.8 / 14.4 Fax 2 line	389

OTHERS

CommShare 550 Phone & Fax Auto Switching	89
National Semi TyIN 2000 Answer/Fax	89
SIIG TeleCommunicator 10-in-1 Fax modem	219
Supra 14.4 Fax modem Int / Ext	99/129
Winport (modem & fax sharing software)	185

12. MONITOR

EMC

EM1412 14" Mono Amber, 90-260v	95
EM1417 14" 1024 x 768 VGA Mono Paper White	119
EM1428 14" 1024 x768 .28, 90-260v	245
EM1439G 14" 1024 x 768 .39	209

MAG (auto switch power)

DX15F 15" 1280 x1028 .28 (no LED)	435
DX17F 17" 1280 x1024 .26 (no LED)	765
MX15FG MPRII 15" Flat 1280 x 1024 .28, NI	469
MX17FG 17" Flat 1280 x 1024 .26, NI	879
Mac Adapter	25

MITAC (3 yr. warranty)

M1564 15" 1280 x 1024 .28, NI	355
L1782 17" 1600 x 1280 .26, NI	699

MITSUBISHI

HL6955SETK 20" 1280 x 1024 .31, NI	1745
TFS6705 Diamond Pro 17" 1280 x 1024 .26, NI, Tinitron, MacII, 100-240V	1045
BNC Cable	39

NANAO (call for rebate info.)

F340iW 15" Flat Screen 1024 x 768 .28	635
F550i 17" 1280 x 1024 .28, NI	915
F550iW 17" 1280 x1024 .28, NI	999
F560iW 17" 1280 x1024 .26, NI	1235
T560i 17" 1280 x 1024 .25, NI	1475
T660i 20" 1280 x1024 .31, Trinitron	1995
F760iW 21" 1280 x1024 .31, NI	1915
F780iW 21" 1600 x 1280 .26, NI	3095

NEC (120V)

SVGA 14" 1024 x 768 .28	329
3FGe 15" 1024 x 768 .28, Mac	569
3V 15" 1024 x 768	469
4FGe 15" Flat 1024 x 768 .28, NI, Mac	625
5FGe 17" 1024x768 .28, NI / w. Lens	955/1035
5FGp 17" 1280 x 1024	1129
6FGp 21" 1280 x 1024	1995
NEC Monitor Lens : Anti-reflection, Anti-satic for 4FG / 5FG / 6FG	*(59)/*(99)/185
FG/MacII Cable Adapter Kit	14.50

NOKIA

449E 15" 1280 x 1024 .28, NI	509
447B 17" 1280 x 1024 .25	955
445X 21" 1600 x 1280 .26	2499

OPTIQUEST

1000S 14" 1024 x 768 .28, NI	279
1500D 14" 1280 x 1024 .28, NI	359
2000DX 15" 1280 x 1024 .27, NI	399
4000DS 17" 1280 x 1024 .27, NI	755
4000DC 17" 1280 x 1024 .27, NI	775

PROTON

PM1561A 15" 1280 x 1024 w. speakers built-in	389

SEIKO (90-132V)

CM2050 20" 1024 x 768 .31, NI, Mac	1295

SIIG

9" VGA Mono Paper White 640 x 480	135

SONY

1430S 14" 1024 x 768 .25, NI, 120V	529
17SE 17" 1600 x 1280 .25	1099
1730 17" 1024 x 768 .25, NI	949
2038 20" 1280 x 1024 .30, NI	1965

STANDARD TECHNOLOGIES

400-M 14" VGA Paper White	119
428-VESA 14" 1280 x 1024 .28, NI	269

VIEWSONIC

4e 14" 1024 x 768 .28, 110/220V	279
5+ 14" 1024 x 768 .25, NI, MacII	475
6e 14" 1024 x 768 .28, NI	295
14e 14" 1024 x 768 .28, NI, MPRII	349
15 15" 1280 x 1024 .28, NI, MacII	449
17 17" 1600 x 1280 .27, NI, MacII	975
17G 17" 1280 x 1024 .28, NI	825
20 20" 1600 x 1280 .28, NI, MacII	1575
21 21" 1600 x 1280 .26, NI, MacII	1799
Mac Cable Adapter	35

OTHERS

Monitor Power Saver	39

13. MOTHERBOARD

AIR (w/o cpu)

486-DX2-66 256k, 3VLB slots IDE I/O built-in	199
486-33 / DX2-66 256k EISA, 3VLB slots	359

---

*(price) .... special, while supply last

CENTRAL
COMPUTER SYSTEM INC.
WIDE SELECTION AT LOW PRICES

TEL: 408 241-0185 FAX: 408 241-0390 **820 Kiely Blvd. Santa Clara CA 95051 Page 3 / 6**

486SH - 33 / DX2-66 256k, Green PC	155
PCI 586-60 256k ISA VLB, IDE I/O built-in	385
PCI 586-60 256k EISA, Fast-wide SCSI	615

AMI

Super Voyager II 486-33 256k VLB, 7 slots	645
Super Voyager II 486-DX2-66 VLB, 7 slots	845
Enterprise III 486-33 256k EISA VLB	875
Enterprise III 486-DX2-66 EISA VLB	1095
Enterprise IV 486-33 256k EISA VLB	735
Enterprise IV 486-DX2-66 256k EISA VLB	935

ALARIS (IBM)

486SLC2-66 64k VLB w. CPU & Math Proc.	279

DIAMOND

486-DX Fast Bus VLB, w/o cpu	175

IBM

486BL3X-75MHz VLB w. CPU & Math Proc	449
486SLC-33 / 66 16k Internal cache ISA v.2 w. CPU & Math Processor	249

LYNX (USA made)

486-33 / 50 / DX2-66 256k VLB, w/o cpu	135

MICRONICS (w/o cpu)

BCP 386-33 64k, 4MB max w/o cpu	85
486-33 / DX2-66 256k VLB	255
JX30 486-DX2-66 256k VLB w. Zif socket	325
486-33 / DX2-66 256k EISA VLB	515
486-DX2-66 256k EISA E2	395
PCI 586-60 256k, ISA 3PCI slots	585

NICE (w/o cpu)

486-33 / DX2-66 256k VLB	175
486-50 / DX2-66 256k Mini EISA VLB	235
486-50 / DX2-66 256k EISA VLB	345

SPRITE (w/o cpu)

486-100 MHz 256k VLB & Adapter, MR Bios	195

SUPER P5VL & P54VL-PCI

Pentium VL- PCI 586-60 256k Flash Bios	379
Pentium VL- PCI 586-66 256k Flash Bios	435
Pentium VL- PCI 586-90 256k Flash Bios	495

OTHERS (w/o cpu)

486-33 128k ISA	105
486-33 256k ISA	119
486-DX2-66 256k VLB w. Zif Socket	125
486-DX2-66 256k PCI, built-in SCSI & AT I/O	285

14. MOUSE & JOYSTICK

AGILER

ATB-610 Serial Trackball	24.50
Master Plus 400	19.50

ANCER (black)

3-button	22

KENSINGTON

Expert Bus 4.0	119
Expert Serial & Trackball 4.0	99

LOGITECH

C14 Serial (2-button) oem	19
Cordless II	85
Cyberman 3D Controller	69
Dexxa Serial	19.50
First Serial C15 oem / reg.	25/31
Fotoman Plus Camera for PC & PS/2	495
Mouseman Bus oem / reg.	49/64
Mouseman Serial oem / reg.	34/50
PG15 Bus oem	45
Trackman Portable	69
Trackman II	75

MICROSOFT

Ball Point Portable	85
Bus 2.0 oem / w. Bus Card	46/69
Bus 2.0 w. Expansion Card	89
Mouse 2.0 + Windows 3.1	149
PS/2 2.0	65
PS/2 Mouse Adapter	7.95
Serial 2.0 oem	45
Serial 2.0 w. 9 to 25 pin Adapter	59

MOUSE SYSTEMS

Cobra (joystick)	14.50
Mouse ! Serial	21.50
New Point (trackball for laptop & PC)	*(32)
PC Mouse (3-button optical)	39.50
PC Trackball II	45
Serial Bus Card (9IRQs)	29
The New Mouse 400dpi (3-button)	39

JOYSTICK :

THRUSTMASTER

ACM Gamecard	29
Flight Control System / Pro	68/114
Flight Stand Holder	19
Formula TI (drive control)	129
Rudder Control	115
Weapon Control MKII	99

OTHERS

Analog Pro.	35
Gravis Game Pad	23
Quickshot Smart Game Card	16.50

15. NETWORK

3COM

3C503 8 bit coax / TP	179/*(159)
3C503 Etherlink II 16 bit coax / TP	169/179
3C507 16 bit Ethernet coax / TP	289/299
3C509 Etherlink III coax / 5 pack	119/539
3C509 Etherlink III TP / 5 pack	122/545
3C509 Combo / 5 pack	139/595
3C529 Etherlink III for MCA coax / TP	245/249
3C579 Etherlink III EISA coax / TP	235/239
3C589 PCMCIA TP / Combo	255/299
3C16270 Link Builder TP, 12 Port HUB	365
TokenLink III 16/4 ISA / MCA / EISA	435/495/645

ADDTRON (Novell compatible)

AE-200JL Jumperless BNC & TP	59
AE-200LB 8 or 16 bit BNC only	52
AE-200LC 8 or 16 bit BNC & TP	55
AE-200LT 8 or 16 bit TP only	52
Arcnet: Arc120TP 8 bit Combo	52
Arcnet: Arc220TP 16 bit Combo	69
Arcnet: 8 Port Active HUB coax / TP	135/145
ET-200STS NE2000 coax compatitble	59
Boot PROM 16 bit	15
HUB: UTP8/ L (8TP + 1BNC)	155
HUB: UTP16 (16TP + 1BNC + 1AUI)	399
Pocket Adapter: BNC / TP	125/129
Transceivers: ET10TB (TP<-->AUI)	39
Transceivers: ET10CB (BNC<--> AUI)	39

ALLIED TELESIS (CentreCOM)

AT-1500T / AT1700T (TP)	79/79
AT-1500BT / AT-1700BT (BNC + TP)	99/99
Transceivers: MX10 / 210T	42/42

ARTISOFT (Lantastic)

Central Station II	399
Eagle EP2000 coax / TP	89/89
Eagle NE2000T Plus Ethernet TP	92
Eagle NE3200 EISA coax w. TPA	*(475)
Eagle NE3210 EISA 32 bit Combo (ws)	215
Ethernet s/w Kit 5.0 w. cable Dos / Win	79/139
Lantastic Z 5.0 (2 stations)	89
Lantastic for TCP/IP single / 5-user	185/760
Lantastic 6.0 Starter Kit coax 2-user	325
Lantastic 6.0 Add On Kit coax / TP	155/159
Lantastic 6.0 Software single user	*(79)85
- upgrade	call
- for 5-user / 10-user	339/599
NR2000A Combo / NR2000 MCA	225/255
NR2000C BNC only / 6 pack	172/975
NR2000C Starter Kit Win	*(429)
NR2000T RJ45 only single / 6 pack	175/979
NR-SI 2000C coax / 5 pk / 10 pk	85/375/685
NR-SI 2000T TP / 5 pk / 10 pk	89/379/689
NR-SI 2000A Combo	129
NR-SI 2000M for MCA	165
Peer-HUB 10BaseT Concentrator	270
Remote Boot ROM for AE-2, AE-3, NR2000	45
T-Runner 8 Port HUB / 12 Port HUB	315/515

ASANTE

AH1012 Intelligent HUB 12 Port	875
10T HUB 8 Port	255
10T HUB 12 Port	495
FriendlyNet with AUI / BNC / TP	69

CASTELLE

JetPress (network print server) for HP II, IID, III, IIID, coax / TP	429
LANPress (print server connects up to 4 printers)	
- Ethernet Thick/Thin coax (1P 3S)	475
- Ethernet 10BaseT (1P 3S)	475
- Ethernet BNC &10BaseT (2S 2P)	435

CC:MAIL

cc:Mail Dos Platform 4.0	199
cc:Mail Win Platform 2.0	345
cc:Mail 10-user pk / 25-user pk	249/579
cc:Mail Fax 1.2	1350
cc:Mail Group Pak for Win	595
cc:Mail Remote Dos	159
cc:Mail Router 4.0	875

DCA

Crosstalk 2.1 for Windows	109
Commuicator	58
IRMA Workstation Dos / Win	225/359
IRMA 3270 for MacII/ LC/ SE	695

FARALLON

PN381 PhoneNet w. Timbuktu for Win	259

IBM

Ether 16 coax / TP / Combo	89/85/95
PCMCIA for Token Ring 16/4	479
PCMCIA 10B2 / 10BT	255/235

INTEL

EtherExpress LAN Combo	129
EtherExpress Flash LAN Combo / 5 pk.	135/625
EtherExpress 16 coax / 5 pk	112/485
EtherExpress 16 Flash coax	122
EtherExpress 16 TP / 5 pk	109/*(465)
EtherExpress 16 TP Flash / 5 pk	125/565
EtherExpress 16 MCA coax / TP	175/185
EtherExpress 32 EISA	439
Flash 32 EISA (ws)	249
HUB: 12 Port EtherExpress ISA	565
HUB: 12 Port EtherExpress EISA	645
LAN Protect 1.5 (virus protection)	685
LAN Sight Support 4.0	345
LAN Spool s/w 386 NLM v3.5A	425
Netport II Thin & Thick / 10BT	395/399
Netport Express XL	465
NetSatisfaxtion v2.5 for Novell	955
TokenExpress - 16/4 ISA	435
- 16/4 EISA	655
- 16/4 MCA	475

LANPRO

2000JC 16 bit coax (BNC only)	49
2000JT 16 bit TP with cable	49
2000JA 16 bit Combo	54
2000A 3-in-1	55
HUB ER5390 : 8 Port (8TP + 1BNC)	175
HUB ER5396 : 16 Port (16TP + 2BNC)	355
Netware NE2000 Combo Starter Kit	195

NATIONAL SEMICONDUCTOR

InfoMover NE2000+ coax / 5 pack	89/415
InfoMover NE2000+ TP / 5 pack	84/365
InfoMover Personal Netware Starter Kit	265
InfoMover Personal Expension 1-user	159
InfoMover NE4100 PCMCIA coax	187
InfoMover NE4100 PCMCIA TP	189

NOVELL

Dos 7 (included Personal Netware)	59
EPROM for NE2000	35
Microdyne NE2000+ coax / 5 pack	95/445
Microdyne NE2000+ TP / 5 pack	89/*(399)
Microdyne NE2000+ Combo / 5 pack	115/*(495)
Microdyne NE3200 EISA coax	*(295)450
Netware 3.12	
- 5 / 10 / 25-user	615/1395/2085
- 50 / 100 / 250-user	2695/3995/6995
Netware 4.01	
- 5 / 10 / 25-user	825/1795/2625
- 50 / 100 / 250-user	3595/5495/9695
NPE 400 Print Server	350
NTR 2000 Token Ring	435
Personal Netware oem / reg.	55/75
Personal Netware NE2000 Starter Kit	195
Unixware Personal Edition - CD version	175
Unixware SDK v1.1 - CD version	75
Unixware NFS	135

SMC (Western Digital)

8003 Plus Elite 8 bit coax	99
8013 Plus Elite 16 coax / 6 pack	125/595
8013 Plus Elite 16 TP / 6 pack	127/629
8013 Plus Elite 16 Combo / 6 pack	149/775
8013 Plus/A for MCA / TP	195/199
8033 Elite 32 coax / TP	595/599
8 Port Concentrator (8TP + 1AUI)	349
12 Port Concentrator (12TP+2AUI+1BNC)	595
Elite Ultra 16 coax oem / reg.	89/110
- 6 pack	*(459)
Elite Ultra 16 TP oem / reg.	88/112
- 6 pack	*(455)
Elite Ultra 16 Combo oem / reg.	99/129
- 6 pack	*(549)
Elite Ultra 32 EISA Combo	235
Netware Boot ROM for Ethernet	34
Token Ring 16/4 ISA / MCA	279

SYNOTICS

Network products	call

XIRCOM

PCMCIA CE-10B2 BNC	*(245)
PCMCIA CE-10BT	*(249)
PCMCAI CE-10BC Combo	*(285)315
PE3-10B2 Pocket Adapter coax	*(255)285
PE3-10BT Pocket Adapter TP	*(259)289
PE3-10BC Pocket Adapter Combo	*(295)325
PEM-10B2 w. Modem / 10BT	*(395)/*(399)

CABLES & ACCESSORIES

10BaseT, Level 3 plenum 1000'	165
Belden 8259, RG58 1000'	165
RG58 500' / 1000'	65/109
Twisted Pair 4-pair, PVC, Level 3	
- 1000' / 500' / 200'	89/55/35

16. POWER SUPPLY

AMERICAN POWER CONVERISON

APC-400 Smart-UPS (286, 386 WS)	289
APC-600 Smart-UPS (386, 486 FS)	359
APC-900 Smart-UPS (386, 486, FS & WS)	569
APC-1250 Smart-UPS (multiple FS & WS)	699
APC-2000-2 Smart-UPS	1150
APC-400 Back-UPS (300W)	179
APC-450 Back-UPS (325W)	215
APC-600 Back-UPS (425W)	285
APC-900 Back-UPS (650W)	375
APC PowerChute Plus :	
- for Novell	65
- for OS/2, Lan Server, 3 Com	75
- for Unix / Xenix	99
- for Windows NT	69
Power Doctor (DOS) I/F Kit for Smart-UPS	79
Surge Arrest Unit	call

GENERAL

250W for Baby AT / Baby or Mid Tower	45/45
250W for AT	47
250W for Full Tower	49
300W for Full Tower	69
550W for UPS	279
1200W for UPS	659

PC POWER COOLING

Standard 220 for Desktop / Full Tower	85/85
Silencer 270	
- for Slim (baby or mid tower)	149
- for AT Desktop / Full Tower	165/165
Turbo Cool 300	
- for Slim (baby or mid tower)	149
- for Desktop / Full Tower	175/175
Turbo Cool 450	
- for Desktop / Full Tower	325/325
Twinpower 900 (redundant)	925

TRIPP LITE

Isobar 4	*(29.95)
Isobar 6 w. Fax modem Protection.	*(45)
Isobar Console CC16 Plus w. RJ11	75
Isotel 4 w. RJ11	*(39.95)
Isotel Ultra 6 w. RJ11	55.95
UPS Monitoring Board for Netware	59

17. PRINTER

BROTHER

HJ-400 Desktop Ink Jet for PC or Mac	275

CANON

BJ-200 Ink Jet	319
BJC-600 Ink Jet	599

CITIZEN

GSX 145 24 pin, 132 column	355
GSX 220 24 pin	179
GSX 230 Fonts & Quiet	219
GSX 240 Scalable Fonts & Quiet	285
Projet II Ink Jet / after rebate	279/249
Accessories :	
- Color Option for GSX 130	45
- Color Option for GSX 145	65

HP (Hewlett Packard w. toner)

Desk Jet 520	289
Desk Jet 500C / 560C	395/569
Desk Jet 1200C / Postcript PC, Mac	1429/2195
Jet Direct for 10BT (J2371A)	429
Jet Direct Combo (J2372A)	465
Laser Jet 4	*(1365)
Laser Jet 4+ / 4M+	1415/1915
Laser Jet 4L / 4ML	659/985
Laser Jet 4P / 4MP	965/1355
Laser Jet 4Si / 4SiMX	2895/4295
Accessories :	
- Duplex C2016A for 4Si or 4SiMX	495
- Envelope Power Feeder 75 Sheet (HP4)	279
- Legal, Letter or A4 250 Sheet Tray (HP4)	99
- Legal, Letter or A4 500 Sheet Tray (HP4)	109
- Lower Cassette w. Letter Tray (IIP, IIIP)	149
- Optional 500 Sheet Legal Letter A4 (HP4)	279
- Postcript (HP4)	329
- Toner for II, III	79
- Toner for IIP, IIP+, IIIP	66
- Toner for 4	99
- Toner for 4L or 4P	69
- Toner for 4Si	135

LASER MASTER

Win Printer 800 Postcript	1075
Win Printer XL600 11x17, 600x660ppi	2350
WinJet 1200 Postcript for LJ4	*(650)775

MICROTEK

TrueLaser MTP-306 6ppm, 2MB, 35 fonts	*(795)

NEC

Super Script 610 Laser 6ppm, 300x300ppi	499

OKIDATA

Printers and Accessories	call

PACIFIC DATA

ProTracer II Ink Jet (CAD Plotter) A4 to A2 size, 360dpi, i960RISC, 512k, 45dBA	1295
ProTracer II-GL2 w. HP-GL2 & 2MB	1699
Accessories :	
- HP-GL Emulation Card	375
- Ink Cartridges	19.50
- Postcript Emulation Card	375
- Sheet Feeder I / II	135/115

*(price) .... special, while supply last

ANASONIC

150 9 pin, 55dBA	139
023 24 pin, Quiet	199
123 24 pin, 43.5dBA, Color capability	239
124 24 pin, 43.5dBA, Color capability	319
624 24 pin, 46.5dBA, Quiet	399
410 Laser, 512k, 5ppm	549
Corona KX-PCR3	49
Developer KX-PDP4	110
Developer KX-PDP5	125
Drum KX-PDM4	99
Drum KX-PDM5	109
Extra Cassette KX-PKC2	45
Fonts Card KX-P47x	95
Fuser Unit KX-PFS5	105
Optional Second Cassette KX-P495	135
Toner KX-P453	42
420 Accessories	
Developer KX-PDP2	95
Drum KX-PDM2	99
Envelope Tray KX-P431	59
Legal Tray KX-P425	45
Ozone filter KX-PFT2	29
Toner KX-P451	42
430 Laser, 1MB, 5ppm	665
Accessories same as 4410	
400 Led Page Printer, 4ppm	499
Apple Talk Interface KX-P412	179
Drum Unit KX-PDM6	95
Postcript Upgrade Board KX-PSU3	399
Postcript Fax Option KX-PFX1	259
RS232 Serial Interface KX-P411	95
Toner Kit KX-P455	17.50
450 & 4450i & 4455 Accessories	
Developer KX-PDP1	95
Drum KX-PDM1	145
Envelope Tray KX-P430	59
Legal Tray KX-P420	45
Ozone Filter KX-PFT1	32
Toner KX-P450	42
455 Postcript, 11ppm	1695
400 Led Postcript Page Printer, 4ppm	799
Accessories same as 4400	
thers Accessories :	
32k Buffer Dot Matrix KX-P43	65
Auto Sheet Feeder for 1124 KX-P36	120
Color Upgrade Kit KX-PCK11	55
Serial Interface Card PS-13	75
Single Bin cut Sheet Feeder KX-PT10	95

MS (Adobe Postcript)

S410 2MB, 45 Fonts, 4ppm	925
Envelope / Legal / Letter Tray	69/69/69
Lower Cassette w. Letter Tray	149
Toner	95

EIKO

mart Label Printer Pro	245
mart Label Printer Plus	159
Standtard Label for Pro or Plus (2 rolls)	7.95

EXAS INSTRUMENTS

rinters	call

ASER PRINTER ACCESSORIES

ACIFIC DATA

5 in One! for HP DJ500	99
5 in One! for HP II, IID, IIP, IIP+, III, 4Si	245
omplete Font Library for HP III, IIID, IIIP	255
ont Bank for all HP Lasers (stores soft fonts)	
75MB / 1.5MB	205/269
acific Connect XI :	
or HP II, IID, III, IIID -	
5 Port 256k / 1MB (4S 1P)	309/379
10 Port 256k / 1MB (10S)	449/519
or HP 4, IIISi, Paint Jet XL300 -	
7 Port 1MB / 4MB (6S 1P)	449/649
10 Port 1MB / 4MB (10S)	519/179
acific DirectNet for Novell	369
acific DircetNet for Novell & UNIX	499
acific Page 2MB, Postcript for HP II	365
acific Page II/XL 4MB, Postcript for HP II	699
acific 4 Postcript for HP 4	259
acific Page PE for HP IID,IIP,IIP+,III,IIID,IIIP	279
acific Page PE 2MB	385
acific Talk	179
ostcript 4MB PE/XL for III	699
lotter in a Cartridge for HP II	225
lotter in a Cartridge PE	
r HP IID, IIP, IIP+, III, IIID, IIIP	225

ELICAN

ibbons	call

19. SCANNER

RTEC (hand)

lewScan 256 w. OCR	89

HP (flatbed color)

ScanJet IICX Color w. Kit	945
- Auto Document Feeder	475
ScanJet IIP w. Kit (gray scale)	499

LOGITECH (hand)

Scanman Easy Touch w. OCR	189
Scanman 256	169
- w. Omni Page OCR	185
Scanman Color	375
- w. Omni Page OCR	419

MICROTEK (flatbed color)

Scan Maker II w. Photoshop L.E.	649
Scan Maker IIXE w. Photoshop	995

MOUSE SYSTEM (hand)

Page Brush 256 w. OCR / after rebate	114/99
Page Brush Color	275

TAMARACK (flatbed color)

ArtiScan 24 bit, Color / 256 Gray Levels	
- w. Publisher L.E. 600 / 800 / 1200 dpi	675/775/1045
- w. Pub.L.E. & OCR 600 / 800 / 1200 dpi	725/825/1095
- w. Photostyler 600 / 800 / 1200 dpi	815/915/1185
- w. Phtoshop 2.5 600 / 800 / 1200 dpi	815/915/1185
Slide Scan Kit (transparency, slide, X-ray)	
600 / 800 / 1200 dpi	525/525/595

OTHERS

Fax Scanner w. Bit Fax & OCR	*(49)79
Omni Scan 256 for Win	*(259)

20. TAPE BACKUP

COLORADO

Backup for Win	39
DJ-20 250MB QIC-80 oem / reg.	149/165
- 3M DC2120 Tape Cartridge	14.50
- AB-11 External Tape Port	37
- Cable (2FD & tape backup)	6
- FC-20 Controller	79
- KE-09 External Kit w/o Controller	69
- TC-15 Controller w. Data Compression	169
- Unix / Xenix Driver	99
PowerTape PT-25 2GB 300Kb/s Int	965
PowerTape PTE-25 Ext	1095
PowerTape PT-50 4GB 300Kb/s Int	1525
PowerTape PTE-50 Ext	1655
Tracker 120MB (printer port)	285
Trakker 250MB (printer port)	319

CONNER

Archive Viper 2150S Int	335
Tape Stor 250MB w. 3M Cartridge	145

EXABYTE

EXB-2501 SCSI-2 750MB - 1.5GB Int	515
EXB-2501 SCSI-2 750MB - 1.5GB Ext	685
EXB-4200 4mm Dat. 2GB Int / Ext	845/995
EXB-8205 8mm Dat. 2.5 - 5GB Int.	1375
EXB-8205 8mm Dat. 2.5 - 5GB Ext	1645
EXB-8505 8mm Dat. 5 - 10GB Int	2085
EXB-8505 8mm Dat. 5 - 10GB Ext	2350
FS1G 2501 w. Control Kit Int / Ext	699/925

IOMEGA

250MB Insider 3.5" with 5.25" frame	185

21. VGA CARD

(All cards 1024 x 768 except stated)

AMI

FastView P9000 2MB VLB	395

ATI

Graphics Ultra Plus 2 DRAM w. mouse reg.	219
Graphics Ultra Pro 2 ISA w. mouse reg.	299
Graphics Ultra Pro 2 VRAM VLB reg.	299
Graphics Ultra Pro 2 EISA reg.	335
Graphics Ultra Pro 2 PCI reg.	315
Graphics Ultra Pro Turbo PCI 2MB	399
Graphics Ultra Pro Turbo PCI 4MB	659
Graphics Wonder 1MB ISA / VLB	175/179

DIAMOND

Stealth 24 DRAM 1MB ISA / VLB	139/145
Stealth 32 1MB PCI / VLB	175/175
Stealth 32 2MB PCI / VLB	229/229
Stealth Pro VRAM 1MB ISA / VLB	225/235
Stealth Pro VRAM 2MB ISA	309
Stealth Pro VRAM 2MB VLB oem / reg.	289/315
Viper P9000 VRAM 2MB VLB reg.	349
Viper VRAM 2MB PCI oem / reg.	359/389

MATROX

IMP/3AH 1600 x 1200, 3MB ISA	735
IMP/3VH 1600 x 1200, 3MB VLB	745
VLB/2 1280 x 1024, 2MB VLB	425
VLB/2 Plus 1600 x 1200, 2MB VLB	475
PCI/2 1600 x 1200, 2MB PCI	399
PCI/2 Plus 1600 x 1200, 2MB PCI	435
PRO/4VZ 1600 x 1200, 8MB VLB	1359
Upgrade/2 2MB Memory	235

MEDIA VISION

ProGraphics 1024 VL 256 Color 1MB	*(199)239
ProGraphics 1024 VL 16m Color 2MB	*(285)339
ProGraphics 1280 4MB	675

METHEUS

Premier 928 VRAM 4MB	765
Premier 928VL VRAM 2MB VLB	599
- 1MB VRAM Memory upgrade	129

NUMBER NINE

T134020, 1280 x 1024, 90Hz, S3-928 chip	
- GXe Level 10 VRAM 1MB ISA	259
- GXe Level 11 VRAM 2MB ISA / VLB	335/339
- GXe Level 12 VRAM 3MB ISA / VLB	395/405
- GXe Level 14 VRAM 4MB ISA / VLB	635/639
GXi-TC L29 1280 x 1024, 256k color, 72Hz VRAM 4MB, DRAM 1MB	1395
9GXe-64 DRAM 1MB PCI / VLB	195/195
9GXe-64 DRAM 2MB PCI / VLB	259/259

ORCHID

Celcius VLB 1MB / 2MB	139/199
Fahrenheit 1280+ 24 bit 1MB VLB	155
Fahrenheit 1280+ DRAM ISA 1MB	139
Kelvin 64 Win Accel 1MB PCI / VLB	165/165

SPIDER

Windows Accelerator 1MB Plus VLB	119

OTHERS

CGA / MGP Card (monographic w. printer port)	29
ET4000 Tseng Lab 1MB ISA / VLB	79/109
Intel Smart Video Recorder	499
Oak087 Super VGA 512k / 1MB	52/65
Paradise Window Accel 31X 1MB	159
Video Plus (video image grabber)	215
V-Mate Pro (flicker free ext. video encorder)	199
WinVision (video capture)	165

SOFTWARE

1. CD SOFTWARE

From $5.99

Call for Wholesale Prices

3D Body Adventure	45
3D Dinosaur Encyclopedia.	19
7th Guest for Dos	26
300 Waycool Windows Games	14
A Hard Day's Night oem / reg.	22/29
A Line in the Sand	34
Adventures (1000 tours) MPC oem / reg.	19/29
Adventure in Heaven	12
Aegis Guardian of Fleet	53
Aesops Fables (E-Book)	15
Aircraft Encyclopedia	25
All Clip Art Graphic Tools	15
American Alive Tour Guide oem / reg.	15/45
American Premier Shareware	9.95
Anabel's Dream - Egypt	*(35)
Animation Festival	24
Arthur's Teacher Trouble	19
Asia ALive Tour Guide	15
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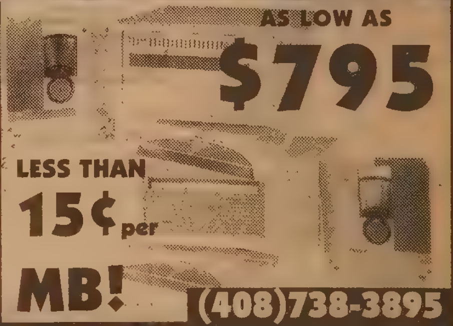

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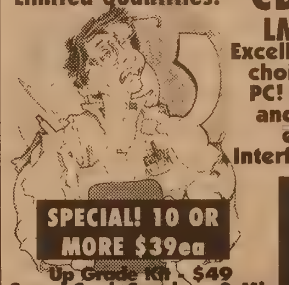

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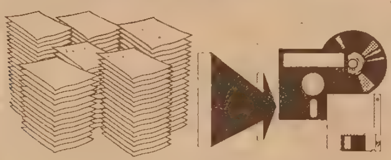

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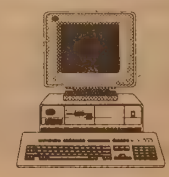

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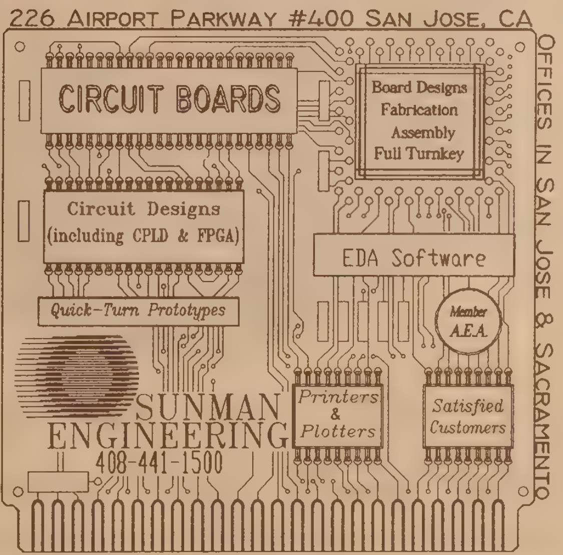

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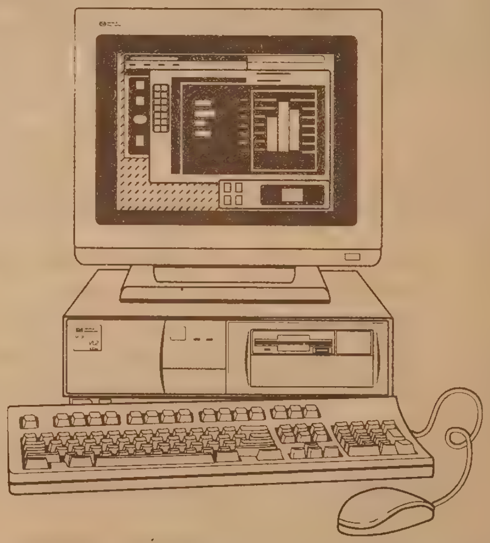

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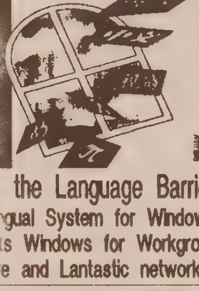

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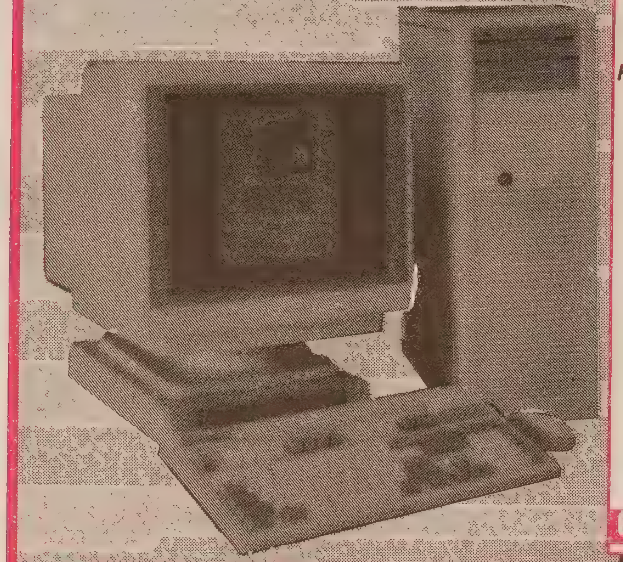

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- Built-In PCI 32-Bit IDE 2FD/2HD Controller
- Built-In 2 16550 Serial & Parallel I/O Ports
- 540MB Maxtor MXT-540AL 8.5ms IDE Hard Drive
- Matrox MGA II PCI 1600x1280 w/2MB VRAM
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- Viewsonic 17 1600x1280 17" .28 76Hz Flat Monitor
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- Microsoft Mouse v2.0 or Logitech Mouseman

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- INTEL PENTIUM 60MHz or 66MHz 64-Bit Processor
- 8MB 72-Pin SIMMS RAM
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- 2 Serial & 1 Parallel I/O Ports
- 540MB Maxtor MXT-540AL 8.5ms IDE Hard Drive
- Diamond Stealth/32 PCI SVGA Card w/2MB VRAM
- MAG DX15F or Viewsonic 15e .28 15" Flat Monitor
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- Built-In 2 16550 Serial & 1 Parallel I/O Ports
- 345MB Maxtor or 350MB Western Digital IDE Hard Drive
- Diamond Stealth/32 PCI SVGA Card w/2MB VRAM
- MAG DX15F or Viewsonic 15e 15" .28 Flat Monitor
- TEAC 3.5" 1.44MB and 5.25" 1.2MB Floppy Drives
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- Matrox MGA II VLB 1600x1280 w/2MB VRAM
  (64-Bit Graphics - Over 90M Winmarks!)
- Viewsonic 17 1600x1280 17" .28 76Hz Flat Monitor
- TEAC 3.5" 1.44MB and 5.25" 1.2MB Floppy Drives
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- F1280/VL or Stealth/24 VLB Card w/1MB
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- Maxiswitch or Focus 101-Key Enhanced Keyboard
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- F1280/VL or Stealth/24 VLB Card w/1MB
- MAG DX15F or Viewsonic 15e NI 15" .28dp SVGA Monitor
- TEAC 3.5" 1.44MB and 5.25" 1.2MB Floppy Drives
- Maxiswitch or Focus 101-Key Enhanced Keyboard
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- Microsoft Mouse v2.0 or Logitech Mouseman

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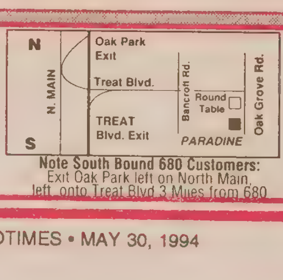

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Orchid Kelvin 64	VLB 32-Bit	1MB	$169
Orchid Kelvin 64	VLB 32-Bit	1MB	$259
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Internal	$155
External	$165
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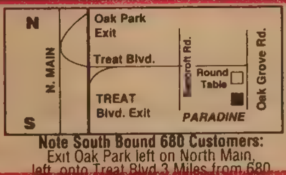

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CPU TYPE	MONO	DUAL SCAN	ACTIVE
486SX-25	$1419	$2059	$3019
486DX-33	1603	2223	3203
486DX2-66	1720	2340	3320

ACCESSORIES

Upgrade to 8 MB	$270
Upgrade to 16 MB	730
Upgrade to 20 MB	940
Internal NiCad battery	95
Docking Station	415
AC Adapter	460
Upgrade to 128K cache model	85

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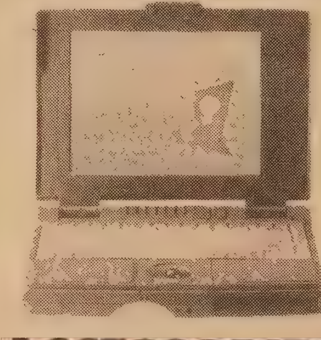

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486DX2-66	1795	2390	3460

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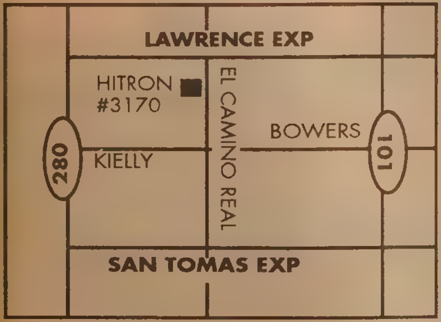

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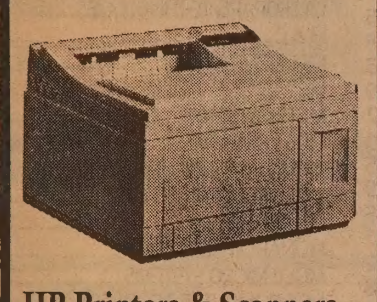

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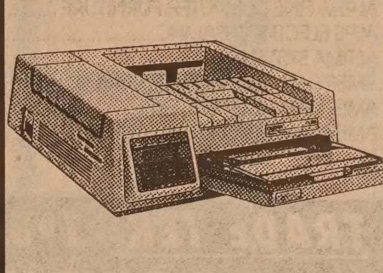

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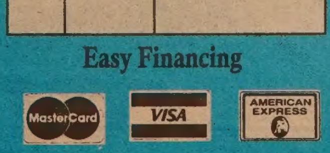

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Progress? Or Are We Just Fooling Ourselves?

I made the mistake of going into my computer archives by accident. Thinking that I was reading current events I ended up having that strange experience you have when you read a two-week-old newspaper and, for a longer time than you'd like to admit, believe you're reading today's news. You invariably run into some clinker that triggers a return to reality. What's interesting, though, is that many of the old reports would still fly today.

Here's a report that came from Computergram International in 1991. If you read it tomorrow, you'd think there was some sort of breakthrough. It's titled, *Computer Recognizes Any Hand Script.*

> Computers often require keyboard input while humans prefer scribing symbols on paper. That clash concerns the National Institute of Standards and Technology (NIST) and a substantial number of U.S. companies. An enormous number of applications await the development of computers that can recognize handwritten characters. The few devices now available for the task are error-prone and very expensive. They also require writing to be rigidly standard and scribed within the boundaries of a letter box. According to NIST, mathematician Charles Wilson has developed new letter recognition software that is quick and accurate. The new method allows computer recognition in 4 milliseconds with 80 percent accuracy on unconstrained hand printed characters and greater than 99 percent accuracy on machine print.
>
> To develop the method, Wilson and his team worked with the U.S. Census Bureau to collect 2,000 handwriting samples. Those samples now are part of a database which contains 294,000 numbers and 728,700 letters. The database will be used as a standard to test new recognition software and hardware now under development. The algorithms for Wilson's recognition system are based on neural network technology that is meant to be implemented on parallel computers. Neural networks learn language and interpret images by the same principles a human brain would use. NIST researchers are now working with the Internal Revenue Service to develop a model recognition system. Additional information on Wilson's database, NIST Special Database 1, is available from NIST's Standard Reference Data Program in Gaithersburg, MD 20899.

> **You have to ask** yourself **why** everyone **in the** pen-based **market was so** convinced **of its** success **and what they've done since to** rationalize **the fiasco.**

This may have fueled a pen-based mania that resulted in amazing craziness and peaked in mid-1992. I guess nobody noticed that the 80 % accuracy claim was hopeless. It meant the system would make constant errors.

Here's a report that appeared in PC Week in April of that year during the height of the frenzy. It seems spooky when you read it a mere two years later: "Pen computing climbed to the 486 level last week when MicroSlate unveiled its Datellite 400 tablet PC at Comdex/Spring. Also at the show, Dauphin, Sanyo and Kurta demonstrated new pen systems. MicroSlate's new 6-pound machine runs the Cx486SLC processor formally announced last week by Cyrix. The pen PC, which supports Go's PenPoint, Microsoft's Windows for Pen Computing and Communications Intelligence's PenDOS, comes with 4M bytes of RAM and a 62M- byte hard drive. Pricing will be announced when it becomes available in June or July. Analysts said pen computers running 486 chips will be attractive to users who want to run PenPoint and Pen Windows. Other hardware announcements were made at the show by Everex, ALR, Leading Edge and NCR."

You have to ask yourself why everyone in that market was so convinced of its success and what they've done since to rationalize the fiasco.

But pen computing is not the only dead end we've witnessed recently. Here's a 1992 PC Week item about the high hopes everyone had for MIPS and it'sRISC chip: "MIPS Computer Systems is readying its RISC architecture for a push into the PC market. At Comdex/Spring, MIPS officials outlined plans that include evolving the company's RISC architecture for broader markets. Next year, MIPS will deliver a high-end processor called the TFP for multiprocessing and scientific markets that promises Cray Y-MP performance. By mid-1993, MIPS will deliver a low-cost processor called the VRX for desktop and portable systems. The VRX, a Joint effort by MIPS and NEC, will offer the benefits of Risc performance at prices that appeal to PC makers. The chip will be suitable for notebook systems because it will operate at less than 2 watts when running at 80MHz, according to a company official."

Well, it's mid-1994 and where's the interest?

Priority Sort

What's interesting to me is that the trade magazines such as *PC Week* have so much news to convey that they literally dump it on the market and it's up to the reader to analyze it. What's considered important by the editors is only guesswork. Unless you are a visionary (few editors are trained for that lofty title) it's impossible to know where things are really going and how to order the importance of any given announcement. It's debatable what should be on the front page and what should be on page 66.

This makes you wonder what would happen if a large company announced a breakthrough technology whereby it could make a computer out of dried buffalo dung.

Digital Equipment Corporation announced today the DBD-100X microprocessor made entirely from dried Buffalo Dung. Using the newly patented dung-matrix optimization field effect, the processor can now be mass produced for desktop use, according to company officials. "It's a breakthrough as far as I can tell," said Wendy Flibber of Webber, Dweeb, Coleman and Robertson. "There's nothing else like it. It should revolutionize the business."

...and on and on...

Page one is my guess. Of course this seems silly, but there are plenty of assertions that run as news that are about as silly.

Much of this has to do with the ever-changing perceptions of the writers, editors and users themselves. This came home to me when, while rummaging through those same archives, I happened upon this interesting note from George Beinhorn. Dated February 10, 1989, it asked a question that would never be asked today, but back in 1989 was a good question: "I'm thinking of buying a laptop PC, but the thought of typing at a keyboard with hard disk attached sends shivers up my spine. Isn't the current laptop configuration a terribly crash-prone design? Do you have laptop hard-disk survival statistics? How do those machines manage to survive 350 keystrokes per minute, not to mention being shifted around on executive laps? Is it wiser to make do with a disk-based laptop?"

Now we're talking about putting a gigabyte drive into a laptop and nobody even considers something like Beinhorn's 1989 concerns.

Reality nowadays seems pretty tenuous. I'm reminded of the assertion I use on my radio show, Software/Hardtalk (KALW), "Remember everything you've learned this week will be null and void by this time next week." ■

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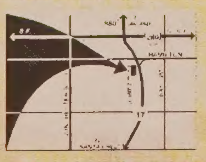

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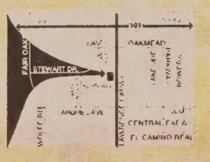

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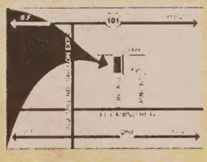

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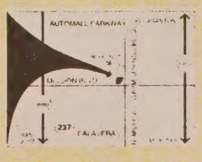

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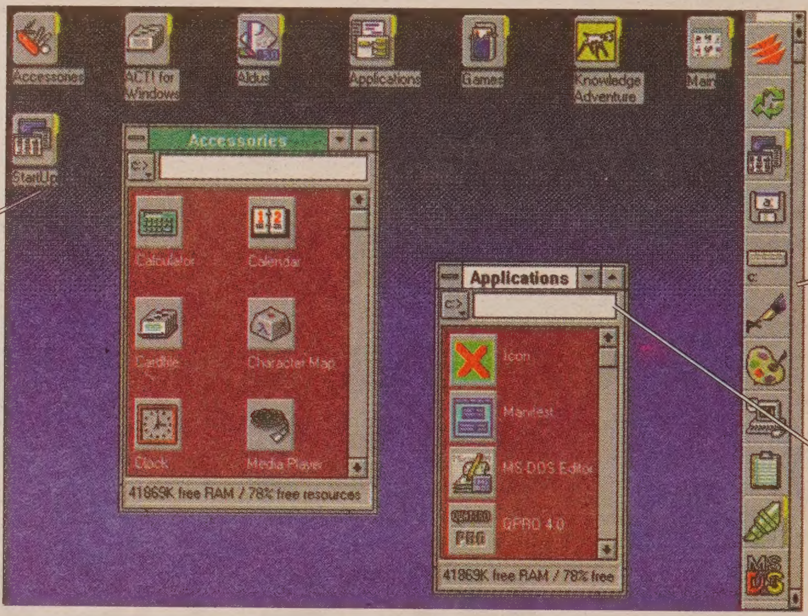
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